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Asa Fitch and the Emergence of American Entomology

With an Entomological Bibliography and
a Catalog of Taxonomic Names and Type Specimens



by Jeffrey K. Barnes



The University of the State of New York
The State Education Department
Albany, New York 12230



Very Truly Yours,

Asa Fitch.

Dr. Asa Fitch, April 1, 1869 (Courtesy Yale University Library [Asa Fitch Papers]).

ASA FITCH AND THE EMERGENCE OF AMERICAN ENTOMOLOGY

*With an Entomological Bibliography and a Catalog
of Taxonomic Names and Type Specimens*

Jeffrey K. Barnes
New York State Museum
Albany, New York 12230



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Preface

On April 15, 1836, the New York State Legislature authorized the governor to employ several scientists to make a complete geological and natural history survey of the State (Laws of New York, Chapter 142, 1836). The plan for the survey, which had been drawn up by Secretary of State John A. Dix, directed attention to the need for knowledge of the habits of injurious insects (New York State Assembly Document 9, 1836). Although the New York project floundered for several years before gaining a firm footing, Dix's plan eventually helped to establish entomology as a profession and as an essential government function. The sesquicentennial of the establishment of the original survey, lineal ancestor of the Science Service of the New York State Museum, provides an excellent opportunity to review this aspect of the history of American entomology.

On May 4, 1854, Dr. Asa Fitch was appointed Entomologist of the New York State Agricultural Society, which had received an appropriation for this purpose from the State Legislature. He thus became the first salaried, professional entomologist in the United States. His celebrated career established the model for professional entomologists in the civil service, and he is remembered as a prime mover in the development of entomology as a profession in America.

Dr. Fitch (1809-1879) lived and worked during an exciting period in American history, one of great human advancement and rapid expansion of the new nation. Agriculture, the cornerstone of the economy, was also expanding and undergoing revolutionary changes. Victorian Americans believed that knowledge is power and that social and mate-

rial leadership would result from the application of science to the common purposes of life. Influenced by a complex web of moral, political, social, and economic elements, entomology emerged during Dr. Fitch's lifetime as an important, recognized profession. At the beginning of his career, insects were generally regarded as insignificant creatures and only occasionally as serious pests. Shortly after the end of his career, entomology became firmly established in America, largely because the teaching, research, and extension network provided a market for professional entomologists. Dr. Fitch's biography is, in essence, a story of the emergence of American entomology.

In this biography, I have attempted to describe the cultural arena in which Dr. Fitch was stimulated to pursue an essentially unoccupied field of study and to highlight the lasting contributions he made to American entomology. Considerable confusion exists concerning his publications and taxonomic work, apparently because few scientists have had an opportunity to study his manuscript notes. I have therefore appended a bibliography of Dr. Fitch's entomological publications and a catalog of the taxonomic names he proposed, along with a description of his type series.

J. K. Barnes

*Albany, New York
May 1985*

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U. S. Department of Agriculture, Washington, D. C. For their interest, assistance, and suggestions, I owe a special debt of gratitude to F. Cadwell, G. P. Colman, A. Cormier, L. L. Deitz, R. J. Gagné, E. Gossen, L. Knutson, T. L. McCabe, N. G. Miller, R. H. Monheimer, J. H. Perkins, P. J. Scudiere and E. H. Smith. New combinations and new senior synonyms were provided by R. J. Gagné (*Cecidomyia grossulariae* and *C. thoracica*), R. D. Gordon (*Valgus serricollis*), J. M. Kingsolver (*Bruchus fabae*), and T. L. McCabe (*Attava aurea* and *Geometra(?) siccifolia*). The task of entering the manuscript on word processor diskettes was ably, efficiently, and cheerfully performed by two dedicated secretaries, Cheryl Tribley and Gayle Femminella. Cover photograph courtesy Department of Manuscripts and University Archives, Cornell University Archives.

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Family Background, Childhood, and Early Education

In 1638, the Reverend James Fitch, with his widowed mother and four brothers, emigrated from Bocking, Essex County, England, and settled in Connecticut. Among the many sons in the early generations of his family in America were statesmen, soldiers, preachers, judges, doctors, lawyers, and educators. The precedent of leadership set by the Puritan Fitches was followed for generations by their descendants. It has been said that they persistently adhered to a family code of pedigree, prudence, pride, and purse. They always went forth with the Bible in the left hand and the purse in the right.¹ They helped push back the wilderness and found new settlements, even in the second and third American generations. After the Revolutionary War, many of the Fitches joined in the exodus from Connecticut. Some Americans went for adventure, whereas others wanted to occupy lands that had been granted as compensation for destruction of their homes during the Revolution; still others fled from burdensome taxes, bleak winters, and infertile New England soils.²

Dr. Pelatiah Fitch, a great grandson of the Reverend James Fitch and grandfather of Professor Asa Fitch, was a physician, justice of the peace, surveyor, innkeeper, and merchant in Connecticut. In 1774 he moved to Halifax, where Governor George Clinton appointed him first judge of Cumberland County, New York (now Windham and Windsor Counties, Vermont). He found the lands in the flourishing town of New Perth, New York (now Salem, Washington County, New York) far superior to those of the rough, sterile, mountainous region of Vermont where he lived. About 1780 he moved to New Perth and practiced medicine, farming, and innkeeping. During the latter part of the Revolutionary War he aided the patriotic cause by serving in the New York Militia, equipping several sons for service in the war, and serving as "Commissioner for Detecting Conspiracies Against the Liberties of America."³

Asa Fitch, youngest son of Pelatiah, moved to Salem with his parents. He served during the Revolution and later practiced medicine in Duaneburgh, New York. In 1795, he returned to Salem and purchased a mill property and farm from his wife's father and brother, since known as Fitch's Point. Dr. Fitch became renowned for his large medical practice, and his extensive library and anatomical museum attracted many students seeking instruction. He was instrumental in obtaining passage of a law for the incorporation of the state and county medical societies and served for many years as President of the Washington County Medical Society. He also served as justice of the peace, county judge, and member of Congress, and was active and prominent in the Presbyterian Church, County Bible Society, State Temperance Society, and the Washington County Agricultural Society.⁴ In 1791, Dr. Fitch married Abigail Martin. A stout, robust, strong-constituted, and industrious woman of large stature, Abigail was fond of reading and apparently made a good wife and mother.⁵

Dr. Fitch and his wife had eight children. Their sixth



Salem, New York, circa 1841 (From J.W. Barber & H. Howe, Historical Collections of the State of New York [1841]).

child, also named Asa, was born on February 24, 1809, at Fitch's Point. Shortly after his birth, Salem was described in Spafford's *Gazetteer of the State of New York* as a "post-township," 46 miles northeast of Albany. The Great Northern Turnpike, from Lansingburgh, New York, to Wells, Vermont, led through the township and was one of the best roads in the State. Several small streams allowed for an abundance of mill seats, and the area's agriculture was respectable and rapidly improving. In 1810, Salem's population was 2833.⁶

Asa spent his childhood on the family farm, passing many days with his cousin Josephus Fitch, building waterwheels, dams, bridges, forts, boats, and other imitations of what they saw adults do.⁷ He also enjoyed skating, sleighing, hunting, fishing, and the attendant excursions "around, over, through, across, into, upon, down to, the fields, the meadows, the creeks, the roads, the orchards, the hills, the woods. . . ." "A shy child, Asa was conscious of an inability to speak in public, or even in private, about almost any subject, and considered himself as possessing only a small amount of general knowledge." It appears that he had little reason to lack self-confidence. Early entries in his diaries betray keen powers of observation and a rare ability to express himself accurately and clearly.

When Asa was about 12 years old, he and Josephus became ill with the measles. That he was not expected to live was obvious to him from the appearance of relatives who were constantly weeping.⁸ Although the disease abated, it left him feeble and emaciated.

Asa received his early education in a local school taught on Fitch's Point by a Mr. Harry Brown, but his father, unwilling to spend a large sum for the formal education of another son, hoped he would become a farmer.⁹ His eldest brother, Martin, had been provided with a literary and medical education, but when nearly ready to begin practice, he died from consumption.¹⁰ Asa's physical weakness, however, induced his father to send him to the Washington Academy in Salem Village.

Asa attended the Academy from 1822 to 1824, but quickly lost interest due, in part, to a mind that wandered easily.¹¹ He felt that personal laziness held his progress to less than half what it should have been.¹² He declared that his mind was far from being as it should be, and the Washington Academy "is not a fit place for a convicted sinner."¹³ However, Asa persisted with his studies, pursuing French, Latin, history, arithmetic, English grammar, composition, declamation, geography, penmanship, and other subjects. Leading roles in literary clubs and an early fascination with botany provided constructive diversions.¹⁴ He even systematically arranged the plants that his beloved teacher, Mr. Weller, had collected.¹⁵

In October, 1824, Asa moved to Bennington to attend school. Homesickness soon overtook his initial eagerness.¹⁶ While home for Christmas he apparently felt



Washington Academy, Salem, New York, in 1885.

overjoyed to declare, "Oh there's no place like home – sweet home."¹⁷ The following February he left Bennington for good.

Religion became a subject of deep speculation and meditation. A year after recovering from the measles he remembered having felt confident earlier that his sins had been pardoned – that happiness should reign through eternity, but he wondered why such confidence had prevailed. He now admitted to sinning throughout life and seldom thinking of religion.¹⁸ In 1824, when Salem was overwhelmed by a religious revival, Asa reported that the town had never seen such days as these; the revival was progressing in all directions. "Most of the population of the town is gathered from time to time together, to conferences, & other religious meetings. Convictions & conversions are experienced by those who have lived in the most profigate [sic] manner. It seems one continued Sabbath."¹⁹

Asa became involved in the revival and attended a conference at which his father's exhortations stirred the youth's religious fervor. "Oh! whilst the Holy Spirit is visiting many, would that he might not pass by me! Oh, that I could but obtain a hope that I was born again – that I might not despise things that pertain to my everlasting peace & happiness. . . ." "Asa was deeply impressed by the revival. "Oh that I might meditate more frequently on death & its awful consequences, if I live a sinful life in this world. That I might strive to have a place appointed for me in the new Jerusalem."²⁰ On May 7, 1824, he was examined for membership in Reverend Tomb's Presbyterian Church. "How great a privilege to belong to a Christian church. My most ardent hope is, that I am not unworthy of such distinction."²¹ On June 6, Asa was admitted to take communion.

The following year, Asa worked for a brief period in a Salem general store that carried sugar, tobacco, tea, allspice, raisins, blankets, Jamaican rum, and other goods.

He was employed to mark and store away goods, clean, post accounts, and make deliveries. This mercantile experience taught him much about the value of property, the necessities of life, what money was, and, partly, what man was. However, much time at the store was passed in idleness. For some reason he did not enjoy reading as much as he used to, and he regretted making so little progress in literature. He began to experiment with alcohol and even dared a man to drink one-and-a-half pints of rum in 15 minutes. "He said it was fine times when liquor could be got without any pay, & gulped it down – then climbed down into a half dug well, & laid there so dead drunk, I was frightened with fears that I had killed him." The man slept and recovered.²⁵

Because Asa saw people of all ages and conditions drinking liquor at the store, he felt there was no harm in

doing the same. At first he did it occasionally, but he soon drank daily. Expecting to be a merchant the rest of his life, he felt it was important to be a judge of liquors. He rationed himself to half a glass a day, but, being his own measurer, the ration began to increase. "Should I ever be a *drunkard*? The thought scared me. I thank God for bringing me to reflect upon my danger." Resisting the gratification of his appetite, he lost all inclination to imbibe.²⁶ In 1829 he joined the Temperance Society in Salem and swore total abstinence from spirits, except as a medicine.²⁷ Asa later became involved with the Stillwater Temperance Society and the Sons of Temperance, and in 1847 he went to New York City to join the Grand Division. On the day of his initiation he noted, "In the lower story of the same building is a nine-pin alley, *and a bar*."²⁸

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¹R. C. Fitch, *History of the Fitch Family: A. D. 1400-1930* (published privately by the Fitch family, 1930), Vol. 1, pp. 96-97 (hereafter cited as Fitch, *History*); K. Loughlin, *Miss Abby Fitch-Martin* (New York: Coward-McCann, Inc., 1952), pp. 3-4.

²Fitch, *History*, pp. 96-104.

³C. Johnson, *History of Washington Co., New York* (Philadelphia: Everts & Ensign, 1878), p. 184 (hereafter cited as Johnson *History*); A. M. Fitch-Andrews, Asa Fitch and his ancestry, *N. Y. Geneal. & Biogr. Rec.* 34 (1903): 155-158 (hereafter cited as Fitch-Andrews, Asa Fitch).

⁴Johnson, *History*, pp. 184-185; Fitch-Andrews, Asa Fitch.

⁵A. M. Fitch-Andrews, undated manuscript copied from her father's (Asa Fitch's) genealogy notes. Manuscript Group 215 (Asa Fitch Papers), Sterling Memorial Library (Manuscripts and Archives), Yale University.

⁶H. G. Spafford, *A Gazetteer of the State of New York* (Albany: H. C. Southwick, 1813), p. 291.

⁷Asa Fitch Diary, 17 Aug. 1865 and 17 Mar. 1868. Manuscript Group 215 (Asa Fitch Papers). Sterling Memorial Library (Manuscripts and Archives). Yale University (hereafter records from the Fitch Diary are cited as Diary followed by the date of the record). Fitch's diary, in 22 volumes designated A-C-G 1-15 and *Memorandum Book of Farm*, covers much of his life from 1821 when he was a schoolboy of twelve to 1879, the year he died.

⁸Diary, 16 Sept. 1825.

⁹*Ibid.*, 23 Feb. 1827.

¹⁰*Ibid.*, 24 Feb. 1822.

¹¹*Ibid.*, 31 Dec. 1829.

¹²Johnson, *History*, p. 186.

¹³Diary, 24 Feb. 1822.

¹⁴*Ibid.*, 31 Dec. 1829.

¹⁵*Ibid.*, 6 Apr. 1824.

¹⁶*Ibid.*, 4 Jun. 1824.

¹⁷*Ibid.*, 2 July 1824-31 Dec. 1829.

¹⁸*Ibid.*, 13 Oct. 1824.

¹⁹*Ibid.*, 25 Dec. 1824.

²⁰*Ibid.*, 24 Feb. 1822.

²¹*Ibid.*, 28 Mar. 1824.

²²*Ibid.*

²³*Ibid.*, 4 Apr. 1824.

²⁴*Ibid.*, 7 May 1824.

²⁵*Ibid.*, 21 Dec. 1825.

²⁶*Ibid.*, 23 Feb. 1827.

²⁷*Ibid.*, 26 Feb. 1829.

²⁸*Ibid.*, 5 May 1847.



Some Early Nineteenth Century Scientific and Agricultural Developments in New York State

After the Revolutionary War most Americans, concerned with the problems of day to day life, were unwilling to cultivate science. Those who did were mainly young amateurs with broad interests. The academies and colleges specialized in classical education; professional instruction in the sciences was almost nonexistent. Nevertheless, American political philosophers saw a close connection between science and political thought. Government was seen as the science of society, and a great interest in obtaining practical results from the sciences developed. Science eventually flourished in America as a panacea for social, political, and economic ills.

Albany, New York, chosen as the State's capital in 1797, became a hub of scientific activity early in the nineteenth century. Intellectual societies interested in the promotion of useful knowledge were soon knocking at the doors of legislators, asking for governmental support for a variety of social, political, and economic causes. The ranks of the societies were filled with men whose tastes and talents ran the gamut from politics to science to agriculture. They pointed out that legislative aid could encourage the discovery of natural resources and assist in making decisions about the advisability of various public improvements. A wave of scientific and political activity passed over the Upper Hudson Valley, and an urgent desire for internal improvements developed.¹

This activity had many fortunate consequences for New York State and the nation. One was the arrival of Amos Eaton in the Albany area. Eaton had had an interest in natural history since his childhood in Chatham, in the Hudson Valley south of Albany. Although natural history was then a popular pastime, it provided few means for making a living. Soon after graduating from Williams College in 1799, Eaton went to New York City to study law in the office of Judge Josiah O. Hoffman. There he made persistent efforts to simplify legal and scientific jargon so it could be

understood by the common man. This fascinated another student in Hoffman's office, Washington Irving, who was then nurturing an ambition to write.



Amos Eaton (Engraved by Alexander H. Ritchie, from Dictionary of American Portraits [1967]).

Eaton and Irving became friends of William Van Ness, legal advisor to the Livingstons, Van Rensselaers, and other influential families from the Hudson Valley. Van Ness

persuaded William Livingston to hire Eaton as agent for his vast land holdings in the Catskill Mountains, and in 1803 Eaton moved to the village of Catskill, where he collected rents for Livingston. Disliking this employment, in 1806 he began payments on a large tract of land in the Catskills and opened an office as an independent realty attorney. He also dreamed of founding a botanical institution in Catskill, which he did in 1810.

The institution was successful, and having been assured in 1806 that he could use the land he was buying as negotiable security, Eaton decided to sell a few acres and use the profits to purchase equipment for the institution. The owner of the land refused to cooperate and filed charges that Eaton had forged a document relating to their 1806 agreement. Eaton was found guilty in 1811 and sentenced to life imprisonment.

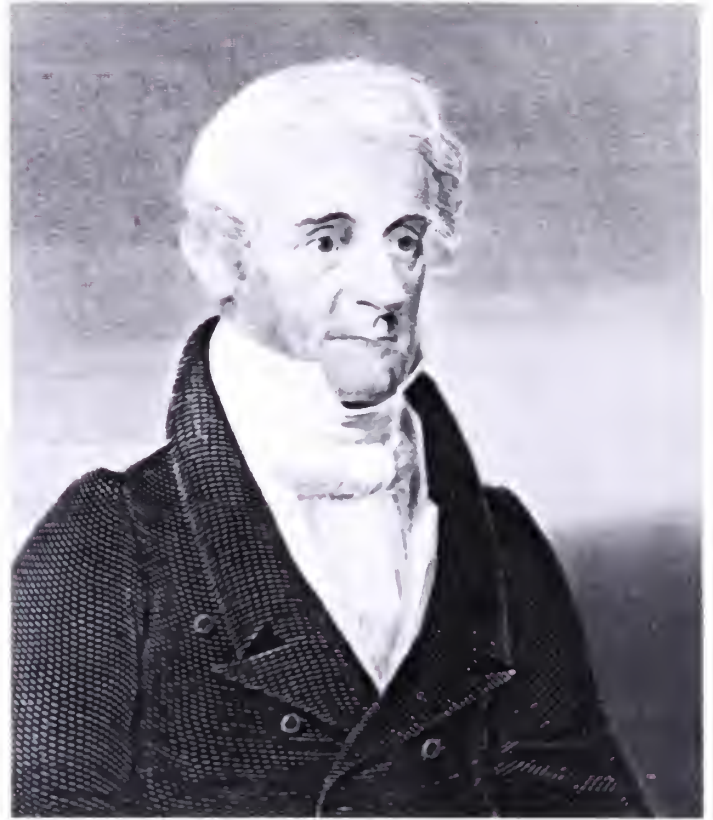
While imprisoned in New York City, Eaton was introduced to the warden's son, John Torrey, who later became a renowned botanist. Inside the prison walls, Eaton taught botany to Torrey. Professor Samuel Mitchell of Columbia College also started visiting Eaton, and Torrey's father began bragging about his prize prisoner. When Mayor DeWitt Clinton became aware of Eaton's clearness of expression, ability and willingness to teach the common man, and knowledge of natural history, he saw the value of these attributes to his gubernatorial campaign, which he planned to build around the Erie Canal issue. Clinton knew that, in order to win legislative approval for the construction of the Erie Canal, he would need to marshal persuasive information about the natural resources and economic potential of the canal route. Governor Tompkins ordered the release of Eaton in 1815, perhaps to avoid political embarrassments in the 1816 campaign and to placate Clinton, Torrey, Van Ness, and Hoffman, who were asking for Eaton's pardon.

Following Clinton's successful campaign, Eaton went to Yale to study natural history with Benjamin Silliman and then returned to Williams College to lecture on natural history. His "common talk" lectures were so lucid and innovative that he won high praises and was awarded an honorary master of arts degree and a permanent faculty appointment. In September, 1817, he was pardoned unconditionally by Governor Clinton, who invited him to Albany to lecture on the natural history and economic potential of western New York.

By 1817 Clinton had persuaded the state legislature to approve initial funding for construction of the "grand canal," but the appropriation provided only enough for a shallow channel between the Hudson River and Lake Ontario. Approval would be needed to extend the canal from Lake Ontario to Lake Erie, thus passing by Niagara Falls and admitting boat traffic to the four upper Great Lakes. During the spring, 1818, legislative session, Eaton delivered his initial lectures before Albany's Society for the Promotion of Useful Arts. His common talk approach was per-

suasive, and funds were appropriated to extend the canal to Lake Erie.²

After one of his lectures, several men from Troy introduced themselves to Eaton, hoping to obtain his services as a lecturer for their fledgling Lyceum of Natural History.



Stephen Van Rensselaer (Courtesy New York State Library).

One of the sponsors of the Lyceum, Stephen Van Rensselaer, was especially impressed with Eaton's style and scholarship. It was an auspicious moment for the advancement of American science. The influential Van Rensselaer was the eighth patroon of Rensselaerwyck, a Dutch manorial estate that enveloped the whole mid-Hudson region. It had been granted to one of his ancestors by the Dutch West Indies Company early in the seventeenth century. Leaving the management of his estate to others, the wealthy and well-educated Van Rensselaer was able to perform many public services that he considered his duties. He had a talent for combining these duties with private interests without apparent conflict. Van Rensselaer's special interest was public, internal improvements, especially with regard to agriculture.³

Before Eaton's Troy lecture series ended, Clinton and Van Rensselaer were pledging funds for a second series in Albany, exclusively for legislators. This time Eaton was to speak on applications of geology and chemistry to agricultural improvements. The series was well attended, and a certificate of honor was presented to the "master teacher." A week later, on April 9, 1819, the legislature passed New

York's first act appropriating funds for the promotion of agriculture. New York thus became one of the first states, along with Massachusetts, to embark upon a liberal program of state aid to agriculture. The act appropriated \$10,000 annually for six years, authorized the formation of county agricultural societies, and established a State Board of Agriculture. Stephen Van Rensselaer became the Board's first president.⁴

In 1820, Eaton and Theodoric Romeyn Beck, principal of Albany Academy and a renowned physician and naturalist, conducted a geological and agricultural survey of Albany County under the direction of the county agricultural society. This was the first attempt in this country to collect and arrange geological facts for the improvement of agriculture. Because it proved useful, Van Rensselaer directed Eaton to conduct a similar survey of Rensselaer County. Eaton was assisted by T. R. Beck's brother, Lewis Caleb Beck, also an eminent physician. The surveyors used a system of neighborhood interviews to collect information for an agricultural calendar based on the experience of working farmers. Their report was so successful that Van Rensselaer was persuaded to support a survey of the entire area adjoining the Erie Canal. Eaton's 1824 report on this survey had a revolutionary impact on geology, primarily because of his new nomenclature.⁵

Bedridden with illness during the summer of 1824, Eaton focused his attention on education. He was convinced that science should be simplified and taught to excite the mind. Like many other philosophers of the era, Eaton also believed that economic and social enrichment could result from the application of science to the common purposes of life. Stephen Van Rensselaer shared Eaton's views and in 1824 created the Rensselaer School, to be conducted in Old Bank Place at the north end of Troy. His ob-

otherwise, in the application of experimental chemistry, philosophy, and natural history, to agriculture, domestic economy, the arts, and manufactures."⁶

The new school was envisioned as a radical departure from classical education. Van Rensselaer ordered that the students learn by taking turns lecturing and experimenting, and that they be examined by presenting demonstrations. He appointed Amos Eaton to the senior professorship and Lewis C. Beck to the junior professorship. The Rensselaer School became the first institution in the United States for scientific and technical training. Today, as Rensselaer Polytechnic Institute, it is the most enduring monument to the memory of the benevolent patroon.⁷

The Fitch family became deeply involved in the new spirit of improvement that pervaded New York State. Back in Washington County, Asa Fitch's father sold his medical practice in 1820 to Dr. Alfred Freeman. Dr. Freeman had been a medical student of the senior Asa, and was married to one of the Doctor's nieces.⁸ With more leisure time, Dr. Fitch became involved in other pursuits. A few months before the State Legislature passed the 1819 law for the promotion of agriculture, several prominent and enterprising citizens of Washington County met, with Dr. Fitch presiding, to consider how the agricultural interests of the county could best be promoted. They decided to organize an agricultural society, and Fitch was elected the first president. The society attempted to make farmers aware of agricultural improvements by holding annual "farmers' holidays" at which there were competitions and interchanges of ideas. It ceased to exist in 1826, due to the limitations of the 1819 State law that initially encouraged it. Washington County would not have another agricultural society until 1841, when the policy of State aid would be revived, and Fitch's son, Asa Jr., would play an active role in the new organization.⁹

Early in 1826, young Asa's only career thoughts were of a life as a merchant. For several years he had enjoyed botany as a pastime, but never thought of natural history as being more than amusement. On March 11, upon returning home from working at the store in Salem, his sister Barbara told Asa that their father and Dr. Freeman felt it would be more beneficial for him to attend the Rensselaer School than remain at the store. They had come to this conclusion by a perusal of the School's constitution, a copy of which had been sent to Dr. Freeman. At first, Asa scoffed at the idea, but on reflecting decided, "... tis a surer way to fame than the one I am now pursuing; I shall acquire much useful knowledge by attending there . . ." The thought of learning more about botany excited him. "Even this, with nothing else I thought would sufficiently reward me for my time etc. & would be a chief amusement during the remainder of my life."

Asa was apprehensive about entering the Rensselaer School. Low self-esteem and shyness stood in his way, but he proceeded with the plan. Late in March he started going to the Washington Academy to brush up on English gram-



Old Bank Place, Troy, New York, original home of the Rensselaer School (Courtesy Rensselaer Polytechnic Institute Archives).

ject was "... to qualify teachers for instructing the sons and daughters of farmers and mechanics, by lectures and

mar and arithmetic. On April 5, he went to Troy and the next day visited the school "to see how it looked & what sort of folks were there." Having heard of Professor Eaton, he imagined this man of science to be "one who knew everything, very stylish, & neat – perhaps foppish." Asa trembled every step of the way, fearing his performance might expose him to "the sarcastic, or more likely the contemptuous thoughts of those whom I saw." Finding no door at first, he went down to view a sloop-lock on the canal. "Should I ever reside in them [*sic*] brick walls? Become acquainted with its inmates? It seemed impossible."

Asa finally found an entrance to the school and trembled all the way as he was led to Professor Eaton. He was surprised to see immediately that Eaton was an ordinary man, and apparently far inferior to many past acquaintances. The professor's dress shocked him:

There he sat, drawing on a pair of boots that did not look as though they had ever seen either grease or blacking – boots that appeared to be made in the fashion of a former age. His remaining

dress, was full as much out of fashion. He had on a cap, made I should judge of squirrel skin, by a hand that had never been engaged in such business before. In short a person of his appearance, is precisely such a one as I should have thought would be hooted out of town.

Nearly all of Asa's timidity vanished upon seeing Professor Eaton. He conversed freely and found that the Professor's language was nearly the same as his own. "I received such attention as I did not presume to expect – was conducted through the different rooms, had the whole course explained to me etc. etc. & to conclude was invited to attend the students on a scientific expedition to L. Erie in a few weeks." Asa quickly became enraptured with the idea of attending the Rensselaer School. From perusing the reading room he found that natural history was a truly interesting branch of learning and one that he could pursue with pleasure. Newly discovered confidence, and even vanity, whispered to Asa that he was somebody.¹⁰

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CHAPTER THREE



On The Erie Canal

The idea of building a grand canal across New York State to connect Lake Erie with the Hudson River had been bandied about for many years before DeWitt Clinton was elected governor in 1817. A channel wedding the waters of the Great Lakes with those of the Atlantic Ocean at New York City would provide the Northeast with a quick and easy route to the fertile Midwest and Michigan's mineral lodes. However, savage conditions and political feuds with our neighbors to the north held settlement of western New York to a minimum until American victories in the War of 1812 ensured free access to the Great Lakes.

At first, the proposal to build the canal was fiercely ridiculed, but eventually it gained steam. People who lived along the proposed route, of course, supported the proposal. The eventual passage of the law authorizing construction of the canal changed American history. The Erie Canal and the railroad that came to parallel it strongly influenced the nation's economic and social life. The cost of transportation dropped dramatically. New York City became the nation's largest seaport and New York State became the Empire State. New England developed into a prime commercial trader with the West, partly because of the canal. Americans and immigrants moved west in droves via the canal. In the decades following the Revolutionary War, agriculture was the cornerstone of the American economy, but it was unprogressive and exploitive. Because land was abundant and cheap, farmers found it advantageous to exploit the land for quick profits and then move elsewhere. Soil exhaustion was a serious problem before 1840 in the East and South, and insect pests and diseases further reduced yields. New Englanders were already moving westward in search of richer soils before the Erie Canal was opened, but after 1825 the wave of migration accelerated. By the 1840's, western farmers were successfully competing with their counterparts in New York and New England for the urban markets created by the In-

dustrial Revolution and the expansion of specialized agriculture in the South.¹

Building the canal was a Herculean task, and the celebration that wedded New York's waters was one befitting an



DeWitt Clinton (Courtesy New York State Library).

auspicious and consequential occasion. In Buffalo on October 26, 1825, Governor Clinton boarded the *Seneca Chief*, which was decorated with a huge painting of him depicted as Hercules resting from his labors. On board were two kegs of water from Lake Erie, destined for the ocean at New York City, along with waters from the Mississippi, Rhine, Orinoco, Amazon, Nile, Gambia, Indus, and Ganges Rivers. A flotilla of five boats left Buffalo at 10 A. M. as a cannon fired. Cannon fire was relayed all the way to New York; the last signal, fired at 11: 20 A. M. in New York, triggered a brisk artillery salute.² The flotilla made its way to Albany, stopping at towns and hamlets along the canal, where celebrations were held and speeches were heard. In Albany there was an elaborate celebration that included processions of State officials, military units and societies, a parade, and a dinner for a huge crowd. On November 2, Asa Fitch boarded the steamboat *New London*, and the flotilla headed down the Hudson River to New York City.³

On the Hudson, Asa perhaps marvelled at the ingenious design of the steamboat. A distant relative and Revolutionary War officer, Lieutenant John Fitch, has been widely credited with having developed the world's first successful steamboat over 20 years before the maiden voyage of Robert Fulton's *Clermont*.⁴ On November 4, the boats arrived in New York City, and Asa witnessed the final benediction of the wedding of the waters:

Twenty five steam-boats crowded with passengers . . . formed in procession in front of the battery, & proceeded to Sandy Hook where two kegs of the water of Lake Erie were poured into the Atlantic by Gov. Clinton. The steam-boats were all decorated with pennons & colors in the most superb style. The procession of the different societies etc. in the city was also very grand. The Coopers, Hatters, Curriers, Comb-Makers, Shoemakers, Saddlers, Printers etc. had each a large car drawn in the procession by horses, on each of which were several men at work at their respective trades.⁵



The Erie Canal Celebration, New York City, November 4, 1825 (Courtesy New York State Library).

In the evening, Asa was entertained by a grand display of fireworks and rockets at Castle Garden, which were all

quite novel to him. After a short visit to New Haven to meet relatives, he returned to New York. On November 10, an auction was held at which the cargoes of the canal boats, including a picture of Governor Clinton uniting the waters of Lake Erie with the Atlantic Ocean, were sold.⁶ That evening Asa headed for Albany on the *Chancellor Livingston*, complaining that progress was considerably retarded because the *Seneca Chief* was in tow.⁷

With celebrations over, the grand canal's work got underway. As thousands of people moved west via the canal, and goods were efficiently transported across the State, businesses sprang up along the banks, and many towns seemed to double in population overnight.

It is not surprising that the Erie Canal became an outdoor laboratory for students of natural history. Amos Eaton had already made a detailed geological study of the canal route, recording and systematizing the geological layers along this distinctive cut of more than 350 miles. He had lectured on natural history at villages along the canal while engaged in the survey, and had already successfully experimented with the first American use of field trips for teaching natural history while lecturing at Williams College in 1817.⁸ Stephen Van Rensselaer, a canal commissioner, had been his patron in the canal survey and school projects.

Professor Eaton wrote Van Rensselaer in March of 1826, explaining that students of the Rensselaer School had requested a scientific tour of the canal. By using a freight boat outfitted with a portable kitchen, the cost of the 700-mile round trip could be held to \$20 per student. Mineral samples and fossils could be collected and sold to defray the expenses of the trip.⁹

Less than three weeks after his initial meeting with Professor Eaton, Asa returned to Troy to join the Rensselaer School expedition to Lake Erie. He arrived on April 25, in time to attend the school's first commencement exercises the following day.¹⁰ He began studying geology after receiving a copy of the canal survey at Van Rensselaer's direction.¹¹ In the company of men of science, his shyness returned and he scarcely knew how to converse with them.¹² Asa quickly took note of the religious attitudes of the students. Although the majority seemed religious, he was shocked by the excessive use of profanity.¹³

On May 2, the travelling school left Troy with a party of 26. In addition to eight recent graduates and several current students, there was Joseph Henry, a recently appointed professor at the Albany Academy. He was beginning a scientific career that would bring him renown for his work with magnetism and electricity, and for his role as first secretary of the Smithsonian Institution. James Eights, a freelance scientific draughtsman who had assisted Eaton on earlier tours, was purveyor for the party. George Washington Clinton, son of DeWitt Clinton and a graduate of Hamilton College, also accompanied the party. Professor Eaton, the commander, appointed an assistant each day to report upon poor conduct, stop the boat at places of interest, oversee bed-making, and perform other tasks.¹⁴

The party travelled on a packet boat named the *LaFayette*, which was pulled by horses or mules on the towpath paralleling the canal. Asa was reminded of a Venetian gondola described by Byron as being just like a coffin clapped in a canoe. The cabin occupied nearly its entire length, leaving only a small deck at each end.¹⁵

The stove and other cooking gear were placed on the forward deck, an arrangement that worked out well until a shower made it impossible to kindle a fire one afternoon. That evening the party was obliged to eat only bread and butter accompanied by glasses of water. Living conditions were crowded. For sleeping accommodations, boards were placed across benches in the cabin, and mattresses were spread upon them, occupying all available space. Asa described the arrangements in his diary of the expedition:

And upon them we arranged ourselves to sleep in two rows, which might remind one of the rows of graves in a burying ground. The first night, when one after another of the sleepers had *fallen into line* and arranged themselves upon the mattresses, the narrow space was so thronged that, looking from the deck down into the cabin, it would bring to one's mind the Black Hole of Calcutta.¹⁶

When it became evident there was insufficient space to accommodate the whole party, several men decided to stay at public houses on shore. Asa contemplated doing the same, but a piece of awning was found, which he and some others spread over the hind deck. Wrapped in a cloak and using a satchel for a pillow, Asa was able to sleep comfortably. On subsequent nights he sometimes lodged in public houses on shore, but as the expedition proceeded, five men from the party stopped at different villages to conduct itinerant lecturing and spread the new Eatonian gospel of American science. Others left as the *LaFayette* approached their homes en route. The company eventually became so reduced that all were able to lodge in the cabin.

Each day the party arose at sunrise, had breakfast at 8:00, dined at 2:00, and had tea after stopping for the night. The boat stopped at localities of geological interest along the way, where the students examined rocks and collected specimens. Travel was slow and leisurely as the boat advanced about 20 miles each day. When the party was detained at a lock or as other opportunities occurred, several men went ashore and walked along the towpath for a few miles, gathering botanical specimens until overtaken by the boat. The tour took place several years before the advent of the temperance reform movement, and Captain Kane, with other boat hands, insisted that the Officer of the Day, appointed each evening by Professor Eaton, bring in a bottle for their entertainment.

Professor Eaton usually lectured on geology in the morning, and a graduate selected by him lectured on botany in the afternoon. At some of the larger villages en route, Eaton gave a public address on the objects of the Rensse-

laer School and the importance of chemistry and natural history.¹⁷

On this tour, Asa first demonstrated his interest in insects. On May 4, after the boat put up for the night at a basin "near Sprakers store, west of Flat creek," he walked on the banks of the river, noticing for the first time the "brilliant lamp of the glow-worm." He thought it was a firefly, but upon taking one of the creeping larvae to the boat was informed of his "mistake."¹⁸

On May 7, the party was at Whitesborough, near Utica. Asa noticed that the area had recently been visited by a powerful religious revival. In his diary he wrote, "Would that while passing through the country where the Holy Spirit is working in the hearts of many of the inhabitants, some of our party might be seized with the flame . . . The members of our expedition are almost universally addicted to the ungentlemanly habit of using profane language . . . Prof. Eaton I believe, cares but little about Religion, only as a show. He did not attend church today. . . Still he would be glad to discourage the profanity of our company."¹⁹

On May 19, the expedition reached Niagara Falls. From reading splendid accounts of the Falls, Asa's expectations had been high, and they were met, but not exceeded.²⁰ At Tonawanda Creek, he found fine fishing in a pristine wilderness area and reported that a person could go out in a boat, splash the water with a paddle, and fish would jump from the creek, some of them falling into the boat. Catching them was so easy that they were sold cheaply; bass weighing two or three pounds could be purchased for half a cent each.²¹

On May 23, upon reaching the western end of the journey at Sturgeon Point, Asa felt a tinge of homesickness:

After wandering . . . in parts where I was utterly a stranger, it was with feelings of no ordinary nature, that I found myself returning to the scenes of my childhood & youth – to the peaceful abodes of relatives & friends of former days. Shall I find them so on my return? Shall all be peace and happiness? Has the destroying angel of Death made his appearance in that dear little circle? Merciful God. I hope not!²²

On May 28, the party was at Rochester on its return trip to the eastern end of the canal. Just as they started making beds, a man appeared at the door and asked for "thees Professor Eaton." It was Constantine Samuel Rafinesque, the famous professor of botany and natural history from the University of Transylvania in Kentucky. Disagreeing with the University's general disregard for science and President Holley's disdain for the subject, he had left the college "with curses on it and Holley." Holley resigned the next year and soon died at sea from yellow fever, and the main college building burned in 1829.²³ Rafinesque was on his way to Philadelphia when he heard about the Rensselaer School expedition at Niagara Falls. He had pursued the expedition and finally caught up with it. There was so much



Constantine Samuel Rafinesque (From Dictionary of American Portraits, [1967]).

confusion in the cabin that Asa, in company with Professor Eaton, Professor Rafinesque, Mr. Clinton, and a couple other members of the expedition retired for about an hour to the Canal Hotel. There, Professor Rafinesque agreed to accompany the expedition on the rest of the journey to Troy.

Professor Rafinesque was a valuable, if somewhat eccentric, companion. Born in Constantinople of French-Italian parentage, he had spent most of his life in America as a moneyless, free-lance naturalist. According to Asa, he was regarded as a "universal genius, ready to investigate whatever subject presented itself to him — a full blooded polytechnic."²⁴ Professor Eaton was delighted with this addition to the party. Rafinesque's *Ancient History; or Annals of Kentucky* had been published in 1824, and his articles in Silliman's *Journal* had attracted much attention, even though they were written in his typical pompous style. At Transylvania he had reviewed Professor Eaton's *Index to the Geology of the Northern States* for *The American Monthly*. Eaton was flattered by Rafinesque's conclusion that "when [Eaton] attempts to show that the geogony of Moses and his account of The Flood do not in the least contradict the facts which experience has revealed, when he proves that

the days-of-Creation have been many periods of time, as so many learned divines have asserted and every geogonist believes, we find him engaged in a desirable act of conciliation between science and religion."²⁵

The arguments and lectures that resulted from the discussions between Rafinesque and Eaton provided an exciting conclusion to the expedition. Rafinesque was so well versed in zoology and botany that each day the students went to him with specimens to be labelled. However, his zealously for naming new species earned him a questionable international reputation as a "species monger." According to Asa, "Ah, that is my new species" became a byword in classes at the Rensselaer School the following term.²⁶ Asa felt that Rafinesque's greatest failing was his separation of many new genera and species without sufficient justification.²⁷ Nevertheless, he decided that because such a celebrated and knowledgeable figure was present, he would pay some attention to conchology and have Rafinesque or Dr. Eights label his shells.

Indeed, Rafinesque missed greatness by embracing too many fields of knowledge and by caustically criticizing many of his contemporaries, but he is recognized for describing a large number of species.

On June 3, the party left the *LaFayette* to view Green Lake, near Syracuse. Asa took a highly poetic point of view and declared it a perfect setting for a romance. Professor Eaton had never seen it, and apparently was not much interested because he allowed the party only a hasty view. Had there been a rock, a bleak barren rock, in place of the lake, Asa mused, they would all have looked themselves blind and still have been obliged to stay longer.²⁸

Professor Rafinesque reported in his autobiography that he went to Troy for a few days, "where I rested awhile with Prof. Eaton, at his school for teachers, founded by Mr. Van Rensselaer to instruct young men in practical natural Sciences, etc., which they learn by giving themselves lessons to each other, admirable plan not yet sufficiently known and adopted elsewhere."²⁹

On June 10, the expedition ended, and three days later Asa returned to Salem. Reflecting upon his experience, he thought, "What new ideas I have received! & how greatly my mind has been improved."³⁰

The tour, which deeply influenced the 17-year-old farm boy from Salem, was a remarkable educational experience for the era. Lasting a little over five weeks, it had been replete with new and valuable experiences — social as well as scientific. The expedition visited the new towns along the canal that later became New York's principal cities — Rome, Utica, Syracuse, Rochester, and Buffalo. The students absorbed Professor Eaton's vast and incomparable early knowledge of American geology and natural history.

... I have often thought of it, that in those 5 weeks, I learned more — I acquired more useful, practical, valuable knowledge, than in any other 5 — yes, than in any other 10 weeks of my life.³¹

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At the Rensselaer School

During his five weeks on Fitch's Point following the canal expedition, Asa occupied himself chiefly in labelling rocks and minerals collected on the trip and in studying botany. He also collected shells, adding 160 species and 360 specimens to his collection of 1700 shells. On July 18, 1826, Asa returned to Troy for a year of formal study at the Rensselaer School.

Both Amos Eaton and Stephen Van Rensselaer, striving to influence the general course of education, regarded their new "Rensselaerian Plan" of education in applied science as having universal value and validity.¹ The plan was immensely successful. From the beginning the students learned by doing, and many of them became America's most respected early scientists.

The daily schedule was long and rigorous, but there was also a certain informality. Much responsibility was given to the students, because there was only one senior professor, aided often by the more advanced students. Also, because Professor Eaton was often ill, the students sometimes engaged in youthful mischief.²

Asa, whom Professor Eaton regarded as one who "always understands his subject, but . . . knows nothing of experimenting," found much sameness in the way each day was passed. The morning bell rang at sunrise, signalling the students to arise and prepare for examination at the sound of the second bell, 20 minutes later. The students were divided into sections, each of which was examined in the reading room, with all others present, on subjects from the preceding day's lectures. Examinations usually lasted an hour, until the breakfast bell rang. Until about 9 or 10:00, they studied and prepared apparatus. About 10:00, lectures on natural philosophy and natural history began. The lectures of the sections in the common laboratory and the assay room began earlier. They lasted until about dinner time, which was 1:00. From dinner until supper, each student could do as he wished. Supper was at

6:00, and at 7:30 the bell again rang, signalling the students to assemble in the reading room, where they studied until 9:00 or later. Asa usually spent the rest of the evening, until about 11:00, writing poetry, reading Burns's works, or in other literary pursuits.³

According to Asa, the board was poor and overpriced, and nearly all the students hated the steward, a Mr. Lockwood, and his family.⁴ Perhaps out of disgust he made a bargain with one Howard Wells allowing him to have as many oysters as he could eat for four shillings. After eating 63, he agreed to stop if Wells would give him two dozen more. Asa sold the two dozen for two shillings and thus obtained all he wanted for two shillings. "I believe I could have eat [*sic*] a hundred if I had *crammed* myself. But I got a cheap supper, at all events."⁵ Oysters remained one of his favorite foods throughout the rest of his life.

A few days later a meal at the Rensselaer School triggered some entomological exclamations from the student:

At dinner, in cutting up some boiled cabbage, I found a spider in it almost equal to any I ever saw in size, & so perfect that I could had I been disposed traced out its specific name. I state this to remind me at some future day of the care with which our victuals are prepared [*sic*]. Our butter consists of about equal proportions of hair & Tobacco acid, our chees [*sic*] has frequently maggots frisking about upon it, there is a bug or fly in almost every dish of tea & coffee we drink etc. etc. etc. If the present class are not all good naturalists the Stewart [*sic*] will not be to blame.⁶

Apparently this experience impressed Asa. When he went home after the first term, he started to collect, analyze, and describe spiders.⁷

On Saturdays there were extracurricular debates among the students, who were organized as a mock Congress of

the United States. On Sunday mornings and afternoons the students attended church, and on Monday mornings Professor Eaton lectured on Biblical history and moral philosophy.⁸ Asa, a country boy with basic beliefs, was now confronted with life in a new urban and scientific setting.



Troy, New York, circa 1841 (From J.W. Barber & H. Howe, Historical Collections of the State of New York [1841]).

He sampled a variety of religious offerings in and around Troy but was disturbed by the deficiency of religion at the new school of science.

July 30, 1826, was a typical Sunday. It began with a morning examination on sacred history, this time on the authenticity of the Scriptures based on geological facts. Professor Eaton's geology was usually reconciled with the Bible, the different strata being classified as originating before or after The Flood. Later in the morning, Asa attended the Baptist Church, and in the afternoon went to his regular Presbyterian Church, where Reverend Mr. Beman, Troy's leading theologian, preached. In the evening he attended more services and returned to the school at 10:00. He attended the Presbyterian Church on most Sundays, but occasionally sampled the services of the famous Watervliet Shakers or the Troy Quakers. Perhaps because of a rigid puritanical background, Asa was uncomplimentary and intolerant of them.⁹

Asa was especially critical of his fellow students for their profanity and lack of religious zeal. He wished he could flee from the company of the ungodly and reflect upon his love of the Great Redeemer. After the Rensselaer School experience was over, he admitted, "I am conscious that I have done many things which were not right, & which require repentance, & prayers for forgiveness. I hope that removed from the most immoral associates I ever had, a new & brighter unclouded day is now dawning, which is to last for life. Oh that my love, & good works may increase, fast as I am hastening down the course of Time."¹⁰

Despite his religious zeal, Asa was still only a youth of 17 during his first term at the Rensselaer School and also prone to participate in the frivolity that arose in the reading

room during evening study hours. Apparently in an effort to overcome his farm-boy shyness, he liked to attract the attention of the other students by "creating a disturbance by buffoonery etc. I wish I was not so anxious to make others laugh at me . . . I must endeavor to reform."¹¹

October 31, 1826, was examination day for Asa's first term. "Morning got up & shaved myself. Muttered 50 'I don't cares!' " Full of fears and anxieties, the hours passed slowly and many a sigh was uttered. He could not bear to study. The board of outside examiners, which included Joseph Henry, was addressed by Professor Eaton. "Then at it we went. Faces red, hands trembling, legs almost unable to support the body, ears deaf & mouth – dumb . . ." He completed the examination successfully and with a great sense of relief. ". . . It seemed almost as though I had got into a new world."¹²

Asa went home for the winter and had a chance to reflect upon his education. "During the last year my improvement I think has been almost incredible. The ease with which I understand some subjects which were before unintelligible to me, too abstruse for me to comprehend, surprises me." He was delighted with the growth of his intellect, but saw still plainer "the immense distance that I am from maturity in Judgement etc. I see the lofty mountains & the extended plains that I have yet to climb & traverse. But I trust I do not see them so plainly as I shall continue to in each succeeding year."¹³

On March 6, 1827, Asa returned to Troy for a second term of study at the Rensselaer School, now more interested than ever in the study of insects. On March 15, he made drawings of two insects from Gregory's *Dictionary*, and two days later he initiated his collection of insects, which would eventually grow to enormous proportions, with a specimen identified as *Panorpa hyemalis*.¹⁴ Asa soon found that descriptive entomology was a wide-open field. With the Professor's son, Timothy Dwight Eaton, who was "full as crazy in collecting & analyzing as I am," he collected, analyzed, and labelled insects as fast as he could, but did not believe he found the correct names for all of them. When descriptions in Rees' *Cyclopedia* did not agree perfectly with many of his specimens, Asa concluded that many were representatives of new species.¹⁵ On a visit to the Albany Academy, he examined the two completed volumes of Thomas Say's *American Entomology*. "In these, scarce the hundredth part of our insects are described . . . Mr. Say does not hesitate to bring forward new species." Cautiously, Asa concluded that, to a certain degree, Say was correct in doing this. "Numbers of our insects are yet undescribed."¹⁶

On June 27, eight students graduated at the second commencement of the Rensselaer School. Asa Fitch, A. B. (R. S.), returned to Salem, happy and inspired by his unusual experience at the novel school for scientific education.

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²*Ibid.*, pp. 50-51.

³Asa Fitch Diary, 18 Sept. 1826, Manuscript Group 215 (Asa Fitch Papers), Sterling Memorial Library (Manuscripts and Archives), Yale University (hereafter records from the Fitch Diary are cited as Diary, followed by the date of the record).

⁴*Ibid.*

⁵*Ibid.*, 4 Oct. 1826.

⁶*Ibid.*, 10 Oct. 1826.

⁷*Ibid.*, 11 Nov. 1826.

⁸Rezneck, *Education*, p. 52.

⁹S. Rezneck, The religious life and struggle of a New York scientist, 1809-1879, *New York History* 53 (1972): 411-436.

¹⁰Diary, 1 July 1827.

¹¹*Ibid.*, 12 Oct. 1826.

¹²*Ibid.*, 31 Oct. 1826.

¹³*Ibid.*, 23 Feb. 1827.

¹⁴*Ibid.*, 15-17 Mar. 1827.

¹⁵*Ibid.*, 24 Mar. 1827.

¹⁶*Ibid.*, 7 Apr. 1827.



Medical Education

Asa spent the remainder of the summer of 1827 at home reading, reflecting upon religion and collecting insects, plants, and minerals. He scolded himself, "I must not idle away my time." The 18-year-old graduate admitted, "This if ever is the period of my life when knowledge must be rapidly accumulated." He also felt that religion should receive a greater share of his attention. "I have been truly negligent on this subject . . . The little knowledge which I have of Heaven & eternity has been mostly picked up as collateral, while some other subject was my grand object . . . My daily walk & conversation exhibits little – almost nothing of the Christian. It is lamentable! I pity myself when I reflect upon it. I must do better. I *must* do better."¹

Asa followed family tradition and began studying medicine. He was guided by his cousin-in-law, Dr. Alfred Freeman, who had purchased the senior Asa's medical practice in 1820. His plan was to study as an apprentice to Dr. Freeman until winter lectures started at the Vermont Academy of Medicine in Castleton, about a day's ride from Salem. In those early days of American medical education, the conventional requirements for a degree of Doctor of Medicine included three continuous years of study under a licensed medical practitioner so that the student could learn the practical, clinical aspects of the profession. The student also was required to attend at least two, two- to three-month sessions at a chartered medical college to learn the more theoretical aspects of medicine. He could graduate after presenting a satisfactory dissertation on some medical subject and passing comprehensive oral examinations.²

When Asa started to study under Dr. Freeman in July of 1827, he prescribed for himself a rigorous schedule – to arise with the sun, study natural history until breakfast, and then repair to Dr. Freeman's shop to study anatomy for several hours. He spent the evenings at home reading and writing. Asa hoped that after his first term at the Academy

he would be sufficiently prepared to lecture on science to the Washington County medical students. His father, then president of the County Medical Society, had proposed that the Society purchase "chemical and philosophical apparatus" and put it in Asa's care if he would lecture every week or two.³

It probably was easy for Asa to choose a medical college. Castleton was nearby, and, although certainly no bustling metropolis, it was an early center of communication, prosperous and cultured.⁴ The Academy had an excellent reputation among country medical colleges in America. The respected faculty included the familiar Professors Eaton and Beck from the Rensselaer School. Some classmates from the Rensselaer School also attended Castleton.⁵

On September 2, Asa left Fitch's Point for Castleton, arriving early the next day. He looked over the village, found lodging and board for \$1.50 per week, and spent some time looking for insects and making geological observations.⁶ On September 5, he enrolled in the Vermont Academy of Medicine and attended the introductory lecture of the term, delivered by Dr. Lewis C. Beck to a "motley collection" of persons in a well-filled room. The subject was the importance of natural history to medicine.⁷

Throughout the term, lectures were given six days a week, without holidays or vacations, the usual program including five lectures daily.⁸ The Academy's curriculum during that era included topics ranging from botany to diseases of women and children. At the beginning of Asa's first term, Dr. Beck, Dr. Theodore Woodward, and Dr. William Tully lectured. Dr. Beck, one of the renowned Albany medical brothers and a noted educator and researcher in chemistry, botany, mineralogy and geography, was engaged by the Academy from 1827 to 1833 to teach chemistry and natural history. Dr. Woodward, one of the founders and a principal administrator of the Academy, and a successful surgeon and excellent teacher, taught surgery, ob-

stetrics, and diseases of women and children from 1824 to 1838. Dr. Tully, a voluble lecturer who helped establish the Academy's high reputation, taught medicine and medical jurisprudence from 1824 to 1829.⁹ Late in October, Dr. Jonathan Adams Allen took the place of Dr. Beck. He taught materia medica and pharmacy at the Academy from 1823 to 1829, but was then dismissed for neglecting his teaching duties. Professor Eaton arrived to lecture on natural philosophy, and Dr. Alden March, a brilliant teacher who became president of both the New York State Medical Society and the American Medical Association, and founder of Albany Medical College, arrived to lecture on anatomy.¹⁰

Asa, of course, was busy taking notes at the lectures, although, characteristically, he himself was dissatisfied by his occasional inattention and by what he saw as his lack of progress. Spare moments were spent transcribing notes, which he may have taken using a system of stenography learned during the summer by copying articles on zoology in preparation for the Castleton lectures.¹¹

On the evening of October 18, a fellow student, Jonathan Chandler, invited Asa to join some other students dissecting a cadaver before Dr. March arrived. With a great sense of secrecy the two students contrived a means to escape the suspicions of Asa's roommates about his absence. At the college, the clandestine party withdrew to the dissecting room, their light hidden under a cloak. In the early nineteenth century, medical colleges found it a perplexing problem to legally obtain human bodies for dissection and demonstration purposes, so illegal procurement was extensive. The bodies were often obtained surreptitiously at night from some country burial ground. After the Champlain Canal was completed in 1822, providing a connection between the Hudson River and Lake Champlain at Whitehall, many bodies in barrels of brine marked "pork" were shipped by canal boat from Albany and Troy to Whitehall, then by wagon to Castleton. They were consigned to a merchant in Castleton who was also a trustee of the Academy.¹²

As early as 1824 students of the Academy in Castleton were arrested on charges of alleged grave robbing. Because local residents were constantly suspicious, dissection by students was done rapidly by a small group before the body deteriorated. A sense of secrecy and urgency accompanied such scenes because a search by a constable was a constant threat.¹³

Asa entered the dissecting room with trepidation. He recorded the scene in his diary:

And when the face of the subject was uncovered I sunk back from the dreadful sight, shuddering at the recollection that I had gone there for the purpose of seeing them [*sic*] pallid features lacerated & dispoiled [*sic*]. The sunken eye sockets, in which the mould was already gathering, & the colourless, but fair countenance, which in a few years might have been matured in the bloom & beauty of youth continually haunted my mind. And the

crimson nails which terminated the little fingers, carried the imagination to that time when the colour first settled there, & the agony, which rent the mother's bosom, as she watched the departure of her dear child. But these feelings gradually wore away. The rest of our company came, & before the evening's work was ended I could almost look upon the face without emotion. My improvement in the mean time I hope compensated me, for the dread which was first sent to my heart.¹⁴

Four days later Asa for the first time "took the knife, & laid open the integuments of the thigh." He no longer felt afraid upon entering the dissecting room, "though I should not dare to attempt it alone."¹⁵

During the latter part of the session at the Academy, Asa tried to correct his habit of using tobacco. He had been using it ever since his second summer at the Washington Academy in Salem. Having realized his addiction to smoking during the winter in Bennington, he had decided to throw his pipe into the fire and begin chewing. While working at the store in Salem, both smoking and chewing were in vogue, but on the Erie Canal expedition smoking was inconvenient and unfashionable, so he once more abandoned it. Asa was now resolved to abandon chewing. "A little smoking, that the change may not be too sudden, & I hope to be thoroughly reclaimed." On November 23, his last quid was finished. "What! unable to overcome any habit! I hope not."¹⁶ A week later he was still longing for tobacco and feeling "half dead."¹⁷ " . . . My mouth must be in the right tone, for me to take any comfort." Asa purchased more tobacco. "Oh the happiness of tasting the fumes of the Indian weed!"¹⁸

On December 11, Asa departed for Salem, intending never to return to Castleton, where he was unhappy with his progress as a medical student, but sufficiently impressed by the Academy. On Christmas Day he somewhat reluctantly went to a party, wishing not to be labelled "a sober old deacon at all times." He was a vigorous young man of 18, weighing about 155 pounds and standing 5 feet 11 inches tall, but parties were a new experience for him.¹⁸ A morally rigorous background dictated that this pastime was improper. Asa had not been kissed since childhood, " . . . but here was — none too much of it." He even took four swallows of brandy, much more than he had consumed the past two years. A religious struggle became evident as he rationalized his involvements in the amusements at the party. "The time spent in them is a chief objection to them I think, & not any sinfulness that there is in them." In the end, he decided that time must be taken to form acquaintances.¹⁹

For the next several months Asa remained in Salem, studying medicine under Dr. Freeman. He again resolved to spend six hours a day for the rest of the winter reading medical books.²⁰ For the first time, he was called upon in a professional capacity — to see if he could do anything for a

Mrs. Marble's "Hysterical, Spasmodical fit." He immediately sent for Dr. Freeman's able council, and the Doctor prescribed "Carb. Ammon., Tinct. Opium – Castor, & warm tea, & bleeding."²¹

Asa experimented with the effects of nitrous oxide, also known as exhilarating or laughing gas. This may appear to have been a self-indulgent lark, but in fact it was probably conceived as a practical exercise in self-instruction for a young medical student. When inhaled, the gas reduces sensibility to pain after an initial period of exhilaration, and it is used as an anesthetic. Assisted by a fellow student, William Savage, Asa made the gas and went to a field below Dr. Freeman's shop to inhale it. Before his witnesses, William and Edwin Thayer, Asa began laughing heartily. He found the sensations agreeable, even ecstatic, and speculated that they would have been more so had a larger quantity been used. The next day, the two students made more gas, and with "half the neighborhood" looking on, Asa "jumped & ran, & slapped my hands & halloed, & once exclaimed 'Happiness'. . . ."²²

As the summer of 1828 passed, Asa was pleased to observe that his bashfulness and timidity, prominent traits in earlier years, were quickly waning. He was becoming more worldly. On October 16, at an "apple pairing [*sic*]," he danced for the first time, but only after much entreaty. He soon found himself making arrangements for a ball to be held on the evening before his departure for New York City, where he would attend a term of lectures at Rutgers Medical College. Objections arose in the small puritanical community. "But, mercy on us! What would folks think, for me to go & bring in a load or two of girls, to dance. . . .!"²³ Nevertheless, Asa was determined to succeed despite all the unfavorable circumstances. Two or three times in the past people had attempted to have a ball on the Point, but without success, and most people seemed to think that it was impossible to do. Asa was worried that his party might fail, thus making him look like a fool. "Calm thoughts are now strangers to my brain. I am as restless as the bark upon the ocean's waves." To make matters worse, Asa's father had heard about a dance or ball being planned and advised his son not to attend, unaware that he was at the bottom of it all.²⁴

On the appointed day, October 29, Asa went to his room to dress in his finest clothes, then left the house without uttering a word to any member of the family and made rounds to pick up the young ladies who had been invited to attend the ball. He was ecstatic that so many had decided to attend. "Oh happiness! happiness! After so much fear & anxiety, & depression of spirits, how did I not feel, when all things were going on equal to my most ardent wishes – exceeding my most sanguine hopes." Upon arriving at the ball after picking up a second load of girls, he found a greatly enlarged crowd. "How did my heart dilate with joy. . . ." A fiddler entertained 17 ladies and 20 gentlemen. Asa was pleased with his progress in dancing – and the party in general.²⁵

At breakfast the following day, Asa was questioned about the circumstances of the party and received advice to refrain from such assemblies.²⁶ He then started for New York City. On board ship from Albany he met Dr. Ebenezer Emmons, who had studied science under Amos Eaton and Chester Dewey at Williams College and graduated with the first Rensselaer School class in 1826. Emmons was on his way to New York to assist John Torrey at the College of Physicians and Surgeons, Rutgers' rival school. Dr. Torrey had been Professor Eaton's botanical comrade while the latter was in prison. Like Eaton, he was adept at devising apparatus to illustrate his lectures. Torrey was a renowned professor of chemistry, but history would remember him best for his botanical avocation. In 1820 he graduated from the College of Physicians and Surgeons and in 1827 was appointed to the chair of chemistry, a post he held until 1854.

Rutgers had been founded only about two years earlier by a group of distinguished physicians and lecturers from the College of Physicians and Surgeons. Disappointed with differences and disputes they had with the trustees of the College over the division of fees, they seceded and founded its only competitor for the lucrative medical student fees in New York City. In their search for legitimacy they won affiliation with Rutgers College in New Jersey. By 1830, the new college would admit failure and cease operation, due largely to pressure from the older institution.²⁷

At Rutgers, Asa joined a classmate from the Rensselaer School, George Horton, whom he described a decade later as his "dearest and most esteemed earthly friend."²⁸ They shared a crowded room with two other students.²⁹ The opening lecture, on forensic medicine, was given November 2, 1828. Thus began a busy four-month visit for the country boy in the expanding city of New York. Asa soon built up a full schedule of medical study at Rutgers – one that included lectures on such subjects as materia medica and anatomy, and others typical of an early medical education. The distinguished faculty included Drs. Hosack, Francis, MacNeven, Mott, and Bushe. Asa spent his days attending lectures and visiting the wards at the nearby hospital; his evenings were filled with the endless task of writing and transcribing notes. He sometimes sat up as late as one or two o'clock, aided by an opiate, and eventually he was overcome with eye trouble.³⁰

Asa took Dr. Bushe's lecture ticket for anatomy and joined his private class in dissection. Dr. Bushe, an Englishman who had just been appointed on the recommendation of London's leading medical men, was guaranteed the then princely sum of \$2600 for four months of lecturing.³¹ Asa's experiences at the hospital and in Dr. Bushe's dissecting room filled an especially noteworthy place in his medical education. He was able to witness many operations and dissections, an opportunity far less available at the country medical school in Castleton.

At noon on November 29, when Asa went to the hospital as usual, his callousness was unexpectedly tested and found wanting. He watched Dr. Steven perform an ampu-

tation of a man's left leg, about half way between the knee and ankle. The affliction was "caries of the os. calcis." The operation provoked an emotional reaction from Asa. "To behold the keen shining knife drawn round the leg severing the integuments – to see these dissected up & folded over, while the unhappy subject of the operation uttered the most heart rending screams in his agony & torment – to see another stroke of the knife cut through the muscular calf of the leg to the bone – & to hear the saw working its way through the bone, produced an impression I never can forget." Asa found it difficult to look on, and he covered his eyes to keep from fainting. "A momentary glance was all I could bestow, & with my eyes averted, I would wail till I had collected strength enough for another look, equally brief, & I was rejoiced when it was through."³²

Despite his busy schedule of medical studies, Asa found time for diversion – and many tests of his rigorous religious and moral background. Sundays were occupied with visiting the churches, sometimes more out of curiosity than a sense of religious fervor.³³ Museums and the theater provided entertainment. As an ardent collector of books and an admirer of romantic tales and poetry, he attended many book auctions, and despite rigid economy he acquired volumes on subjects ranging from medicine and science to poetry.³⁴ Contrary to earlier resolutions, he drank heavily on Christmas Day to relieve the loneliness of life in the city.³⁵

Late in November, Asa joined a dancing class. The instructions concerned the behavior of polite society more than expected, so this country boy decided he would learn how to bow and shake hands to the utmost of etiquette.³⁶ He attended classes regularly, even when ill, and occasionally used opium to stimulate his "dancers."³⁷ Although worried about the opinions of folks back home concerning the supposed sinful character of dancing, Asa derived great pleasure from the gaiety and frivolity – and his newly acquired knowledge of the manners and customs of city life.

As the year 1828 came to a close, Asa reflected upon his progress toward the age of manhood. Worried about a natural diffidence and bashfulness, he decided that much success and character as a physician depended upon being free and composed in the company of strangers. Having taken a fancy to the fairer sex, he resolved to mix more with neighbors and friends and acquire the art of conversation. "My proficiency has been great, but not so much so, as more resolution, & a natural faculty for abstract thought, would have made it. . . . But time will carry me forward to the mark at which I aim, & had I the ready command of ideas & language with which many are endowed, my progress would be much facilitated."³⁸

In February, Asa returned to Salem and again studied medicine under Dr. Freeman, with whom he was disappointed because the Doctor did not take his students out to see enough practice. Of course, Asa also pursued natural history. In August he discovered an old edition of Lin-

naeus' *Systema Naturae* in the library of some medical acquaintances. He regretted not having known about it earlier because by now he would have had part of it translated and, doubtless, would have found the correct names for many insects.³⁹ After a summer of medicine, science, and social diversions, he departed again for a term at the Vermont Academy of Medicine, although he had already made up his mind not to return to Castleton and, in fact, had made plans to meet roommates from New York City at the Medical College of the University of Pennsylvania.⁴⁰ On August 26, he left, determined not to make Salem a home until finished with medical school, and perhaps not even then.⁴¹

At Castleton, Asa resumed the long schedule of lectures, which quickly became tedious, and he became homesick and melancholic. His schedule soon became so reduced that he wondered if it was worth staying, until he thought to himself, "But the dancing school, ah yes, I will stay . . . for what more do I want."⁴² He continued to experiment with drugs, inhaling ether and consuming opium, all in the supposed interest of self-edification. Involvement with a debating society offered an opportunity to study "Ladyology."⁴³ Of course, Asa attended church regularly and continued his interest in natural history. On a countryside walk he saw a species of wasp, ". . . black, shining, the middle of its antennae white. Lovely insect! May I yet contribute to bring thy species to the knowledge of the world! I had almost declared '*I will – I will do it.*'"⁴⁴

Asa's loneliness became burdensome. "Oh then what ecstasy would attend this period of my life, if passed 'in my native valley.' But now I feel more like getting a name & a fame, & making me a home where nature did not apparently design it – where congenial feelings may be gratified. But these are too much like the musings of a melancholic. Oh, may it ever be my lot, to be contented – to be happy, in whatever sphere I may be placed, nor pine away my life, with needless gloomy thoughts, when at best there is sorrow enough."⁴⁵

Finally, late in November, Asa became overly weary of the lectures. His three-year course of medical study was supposed to last until July, but he decided to apply six months of his Rensselaer School education toward the medical degree, and he applied for degree candidacy.⁴⁶ Lectures ended on December 1, and Asa submitted a dissertation on the relationship between the natural sciences and medicine.⁴⁷ On December 4, he underwent oral examination, and on December 8 the students read their dissertations. Asa's was readily approved. He noted that the last dissertation read was on "Fecundation, & a nastier, & more disgusting piece could scarcely have been composed." Apparently, every movement and appearance in the act of copulation was minutely described, and the professors and students shook with laughter.⁴⁸

The next day, Asa Fitch received the degree of Doctor of Medicine. He packed, said goodbyes, and boarded the stage with other students. For some distance at short inter-

vals they all sang out in full chorus, "So fare thee well, old Castleton, I ne'er shall see you more."⁴⁹

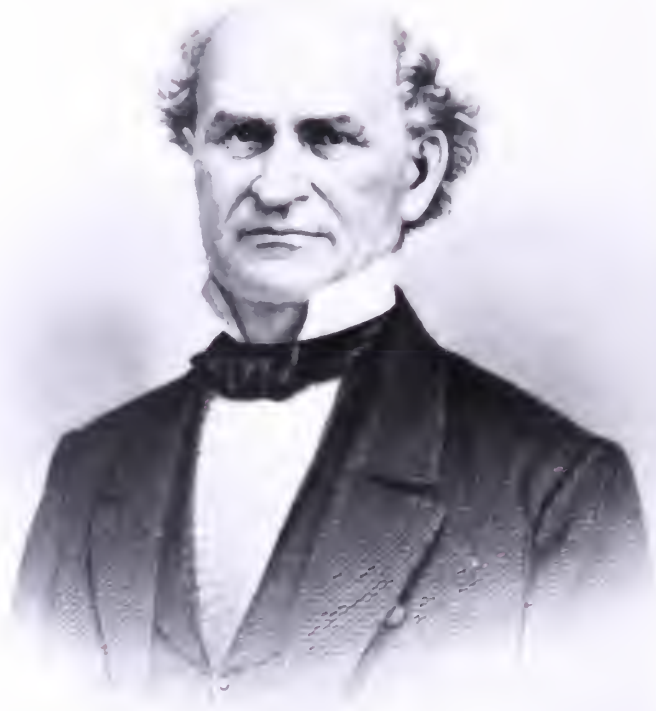
Shortly after returning to Salem, Asa's father again objected to his attendance at dancing lessons, but the young doctor was not about to give them up. He was determined to shake off the diffidence and timidity, the "say-nothing-to-nobody-ness," that had plagued his youth. It would never do for a doctor, and he was resolved to cure himself by socializing so he would not be regarded as an "ill bred booby." He was satisfied that dancing lessons had helped him attain this goal with no moral damage.

I can now go into company, yes, & polite company, & feel myself at home. . . . Let any one compare me, as I was two years ago, & as I now am, & judge if I have not gained infinitely & at a cheap rate. I am satisfied with myself. . . . I have danced. I have played. I have kissed rosy cheeks. I have won maidens' smiles. Yet I do not think I have gone astray, or opened the wounds of my dear Saviour afresh, or sinned deeply against my God. I have not caroused. I have not drank [sic] the intoxicating draught. I have not taken my Maker's name in vain. And if dancing is to be condemned from the vicious habits to which it leads, I can aver that I have never felt this tendency. I have not gambled. I have not squandered away money. I have had no illicit connections. I have not even had any such inclinations. Never, no never.⁵⁰

On Christmas Day, at a conference held by the First Presbyterian Church, the Reverend Mr. Tomb and the senior Asa Fitch were appointed to discuss the young Dr. Fitch's refusal to renounce dancing. Dr. Fitch decided to withdraw from membership in the Presbyterian Church if he were told to stay away from the communion table.⁵¹ The day after New Year's Day, his father told him he must not receive communion. He considered joining the Episcopal Church in Albany, where he was preparing to go to attend the private medical classes conducted by Dr. March.⁵²

On January 11, 1830, Dr. Fitch heard Dr. March's introductory lecture. He spoke about his proposal to establish a medical school and hospital in Albany, a hope realized several years later. Dr. Fitch remained in Albany for about three months, taking advantage of the city's cultural institutions and using their facilities to further his knowledge of natural history. At the Albany Academy he visited Dr. Beck, who labelled his plants. Dr. Fitch also noted a few works on entomology in the Academy's library, particularly Samouelle's *Entomologist's Companion*, from which he copied material on the Linnaean genera.⁵³ At the State Library he examined Say's *American Entomology*; pleased with it, he decided to try copying some of the work.⁵⁴ Back at the Academy's library Dr. Fitch discovered Say's descriptions of insects in the *Transactions of the American Philosophical Society* and perused Blumenbach's *Natural History*. "Oh, I must take some of these out, & must go up there & copy

others. I shall then (with copying at the State Library) have all that is known of American Insects."⁵⁵



Dr. Alden March (Courtesy New York State Library).

One evening Dr. Fitch went to the Albany Museum, the private enterprise of one Mr. Trowbridge, to see a ventriloquist named Nichols. Here something excited his imagination:

The upper, Natural History department . . . made me more longing & covetous than anything I have seen for some time. I saw a most superb green butterfly, among a countless number of insects, which I almost wanted to break through the glass and take sans further ceremony. But that would be stealing, so I thought of purchasing it. But I have no money to spare, so how shall I get it? Well, I have half a mind to strike a bargain with Mr. Trowbridge, to label his specimens "on the shares" by which means, I should obtain a good knowledge of Entomology, & secure to myself a most superb collection — though it would take up considerable time; but I intend to spend no small proportion of my life in this study. Wait till I have been here 3 or 4 months & then see.⁵⁶

Dr. Fitch also found time to go to Troy to visit with Professor Eaton, from whom he learned something about entomology. He was glad to find Eaton a staunch supporter of the Linnaean genera. He found the more recent arrangements to be nothing more than confusion heaped on confusion and that every new writer rendered this "confusion worse confounded." "Books on books are added, each

varying from its predecessor, *ad infinitum*; & the young Entomologist will find no pleasure in pursuing [sic] his favorite science, till he takes the system unadulterated of the Prince of Natural History, The immortal Linneus [sic]."⁵⁷

On February 24, 1830, Dr. Fitch observed his twenty-first birthday. He had made up his mind to go west, to Illinois. "My first enquiry when hunting up a place shall be 'how many balls & parties have you had the past week.' And all I ask is to make enough by day to spend by night. Oh, that will be the golden age of my life."⁵⁸

On March 19, Dr. March gave his last lecture. Dr. Fitch then spent some time copying entomology, and on the way back to Salem again visited Professor Eaton in Troy.⁵⁹ He was interested in accompanying the upcoming Rensselaer School flotilla from New York City to Lake Erie and saw the expedition as an opportunity to begin the intended westward journey.⁶⁰ In Salem he collected insects, which were by now one of his chief objects of study.⁶¹ Dr. Fitch had further disagreement with the Rev. Tomb, who refused to give him a certificate of standing in the Presbyterian Church because of his refusal to renounce dancing.⁶² On June 4, Dr. Fitch received a letter from Professor Eaton, informing him of his appointment as Assistant Professor of the Rensselaer School, "if the honor of the station will be sufficient compensation." He concluded, "I think it will."⁶³



Albany Academy (Courtesy New York State Library).

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- ³Diary, 29 June 1827.
- ⁴Waite, *Castleton*, p. 23.
- ⁵S. Rezneck, The study of medicine at the Vermont Academy of Medicine (1827-29) as revealed in the *Journal of Asa Fitch, J. Hist. Med. & Allied Sci.* 24 (1969): 416-429.
- ⁶Diary, 3-4 Sept. 1827.
- ⁷*Ibid.*, 5 Sept. 1827.
- ⁸Waite, *Castleton*, p. 117.
- ⁹*Ibid.*, pp. 183-189.
- ¹⁰Diary, 25 Oct. 1827.
- ¹¹*Ibid.*, 4 Aug. 1827.
- ¹²Waite, *Castleton*, pp. 123-124.
- ¹³*Ibid.*
- ¹⁴Diary, 18 Oct. 1827.
- ¹⁵*Ibid.*, 22 Oct. 1827.
- ¹⁶*Ibid.*, 23 Nov. 1827.
- ¹⁷*Ibid.*, 1 Dec. 1827.
- ¹⁸*Ibid.*, 10 May 1828.
- ¹⁹*Ibid.*, 25 Dec. 1827.
- ²⁰*Ibid.*, 3 Jan. 1828.
- ²¹*Ibid.*, 18 July 1828.
- ²²*Ibid.*, 6 June 1828.
- ²³*Ibid.*, 27 Oct. 1828.
- ²⁴*Ibid.*, 28 Oct. 1828.
- ²⁵*Ibid.*, 29 Oct. 1828.
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- ³³*Ibid.*, 4 Dec. 1828.
- ³⁴*Ibid.*, 7 Nov., 11 Nov., 2 Dec. 1828.
- ³⁵*Ibid.*, 25 Dec. 1828.
- ³⁶*Ibid.*, 21 Nov. 1828.
- ³⁷*Ibid.*, 19 Jan., 13 Feb., 18 Feb. 1829.
- ³⁸*Ibid.*, 31 Dec. 1828.
- ³⁹*Ibid.*, 18 Aug. 1829.
- ⁴⁰*Ibid.*, 19 Feb. 1829.
- ⁴¹*Ibid.*, 26 Aug. 1829.
- ⁴²*Ibid.*, 23 Oct. 1829.
- ⁴³*Ibid.*, 14 Oct. 1829.
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- ⁴⁷*Ibid.*, 1 Dec. 1829.
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- ⁵³*Ibid.*, 14 Jan., 16 Jan., 13 Feb. 1830.
- ⁵⁴*Ibid.*, 15 Jan. 1830.
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- ⁵⁷*Ibid.*, 17 Feb. 1830.
- ⁵⁸*Ibid.*, 5 Mar. 1830.
- ⁵⁹*Ibid.*, 19-20 Mar. 1830.
- ⁶⁰*Ibid.*, 1 Apr. 1830.
- ⁶¹*Ibid.*, 7 Apr. 1830.
- ⁶²*Ibid.*, 20 May 1830.
- ⁶³*Ibid.*, 4 June 1830.



To the Western Frontier

Dr. Fitch quickly prepared for the second expedition on the Erie Canal. On June 15, 1830, he went to Dr. Freeman's house, where he obtained a highly laudatory recommendation and copied information about the mode and amount of medical charges. He also selected shells and minerals to take west.¹ The next day he got a recommendation and some good advice from Dr. Proudfit and took his "interview finale" with his dear friend Clarinda Taggart:

Oh, Clarinda Taggart, my business in this line, is now done, with you, forever. My lips have come in contact with yours, times & ways without number; & for 3 years, my hours of glee have generally been shared with you. But they are now all gone; fled forever! Well, your charms will never be obliterated from my memory, with whatever faults they may be blended.²

On June 17, Dr. Fitch arrived at the Rensselaer School only to learn from Mrs. Eaton that the Professor had started for New York about an hour earlier. Disappointed, he considered steering directly for the West but, instead, decided to stay in Troy for a few days. His father contributed \$100 toward travel expenses, the last money he thought he would ever receive from his parents. It was enough for the journey to Galena, without stopping to raise funds by popular lecturing.³ Dr. Fitch spent time at the Rensselaer School copying entomology from Rees' *Cyclopedia*, and on June 21 boarded the steamboat *New Philadelphia* for New York. Apparently, it was an uncomfortable journey:

There were sundry noises constantly sounding in this ear, & sundry others, of a different kind, but equally loud, in *that* ear. These divers sounds, passing up my auditory nerves, & meeting formed a kind of nameless something, I cannot tell what — but it kept me awake till — till I dropped to sleep

... Oh, I was ready every moment to jump on the explosion of the boiler, of which, judgement could not persuade fancy, there was no danger. The letting of the steam, made me fear & tremble — that sharp whizzing! Enough! How could I sleep. But I dozed again. Then a stick of wood would fall heavily on the deck. Heigho! That was the boiler. I could not endure it! So I got up. Took coat & boots in my hand, & fled from this place of terror, into the aft cabin, where I drew them on.⁴

In New York, Dr. Fitch met Professor Eaton and several others, and the Rensselaer School flotilla started up the Hudson River on the steamboat *General Jackson*.⁵ Along the way they took in the sights and studied natural history. At West Point, Dr. Fitch heard Professor Eaton telling a Mr. Brown and other gentlemen that the assistant professor was "the best Entomologist — knew the most Insects of any one in U. S." Dr. Fitch denied it, but Mr. Brown advised him to write an essay for publication on the importance of entomology and to argue for the science's cultivation. Dr. Fitch told Brown he believed he should study in youth and publish in mature life.⁶

By the end of June the group was back at the Rensselaer School, and on July 1 the flotilla got underway on the Erie Canal on a boat named the *Surprise*. The students were anticipating a pleasant tour in which they would fill their natural history cabinets with a variety of elegant and valuable specimens and their minds with practical knowledge. At the locks at Cohoes Falls, Dr. Fitch left the boat and walked on, insect net in hand. He rejoined the boat further on.⁷

Dr. Fitch remained with the flotilla only a few days; he quickly became weary of the students' jealousy and quarrelsomeness.⁸ Disappointed because of Professor Eaton's illness and inability to continue the trip, he decided to leave the boat in Utica, where he collected insects, attended church, and taught botany at the Utica High

School. He was offered \$20 plus room and board to take over a botany class for three weeks, but accepted only \$15. Among the teachers who were prominent at the school were Fay Edgerton, a graduate of the Rensselaer School, and Asa Gray, the botany instructor, who later, as professor of Botany at Harvard, earned world renown. One of the students in Dr. Fitch's class was James Dwight Dana, who would go on to become a member of the Wilkes expedition, a professor at Yale, and one of America's early scientific giants, particularly in the fields of geology and zoology.⁹

Dr. Fitch visited many churches and heard stirring remarks while in Utica. One Sunday a Mr. Edward Beecher, an agent of the American Sunday School Union, spoke on the proposed effort of the Union to establish Sunday schools throughout the Mississippi Valley. These remarks went to the bottom of his heart, and his emotions were so strong that tears gathered in his eyes as Mr. Beecher told of the ignorance and moral waste in the Valley. ". . . I felt every fibre of flesh creeping on my bones. Oh, I shall go there, & I shall act. . . ."¹⁰

On August 3, Dr. Fitch had his boxes addressed and loaded onto the boat *Mobile*, of the New York and Ohio Line. His diary reveals that he reflected upon the exciting adventure before him:

And now I was again gliding over the *long, long canal*, full of the ardent hopes of youth; now I was anticipating a long but pleasant journey, through one of the loveliest countries on the face of the earth, this moment looking upon the most beautiful & picturesque of nature's rural scenes, the next upon those on whose features grandeur & sublimity is impressed; now I was journeying to the "far west regions" of Missouri, Illinois, & Michigan, thousands of miles beyond where my feet have ever trod before; now I was to go along the most stupendous canals, rivers, & lakes of the new world, to the *Eden* of my native country – the El Dorados of America – whose mineral stores are inexhaustible, whose fertile soil is unparalleled, where banks of wild flowers ever varying in colour, bloom from early spring to late autumn, to gladden my eyes, & employ my leisure hours in studying them – where rare insects of the richest & most splendid hues – from the rich golden, the polished coppery, to the glittering green, or the bright rose tints, are ever shooting through the air, or feeding on the gay flowers, to woo my mind, & deck my cabinet. Oh how my heart throbs with bliss, on anticipating my coming home. Let me *on, on*, fast as the powers of Equinus, Eolus, & Neptune – aye & *steam*, more powerful than all, can carry me. Let me see these scenes, feast my eyes with the sight of this Elysium, & my mind with investigating its new natural objects!¹¹

The boat was crowded with a heterogeneous assemblage of emigrating Scotch, Irish, Yankees, and a few others. All

were travelling to western regions, many of them seeking homes in the wilderness, but none were going as far as Dr. Fitch.¹²

Dr. Fitch disembarked in Jordan, New York, to visit a delightful young lady from his home town, Emily Wheeler, whom he had not seen in two years. He dressed in the best of style and suppressed the shyness and timorousness of youth. Over breakfast, the couple discussed the subject of marriage, and Dr. Fitch told Emily he did not believe he would find a wife in Salem, Troy, or Castleton, that some of the western squaws stood the best chance, and, some years hence, she might expect him to stop in with a wife and two or three papooses while on a return trip to visit Salem. His true intentions, however, were to wait and see if he could support himself before marrying, "till my youthful passions were cooled, & my wild oats sown. . . ."¹³

Dr. Fitch continued westward, by canal, lake, river, and road, by canal boat, steamboat, stage, and horseback, passing through a cross section of a growing America: Buffalo, Ashtabula, Wellsville, Wheeling, Louisville, Shippingport, Portland, and St. Louis. Of course, he collected insects along the way. Early in October, he arrived in Greenville, Illinois, poorer by \$112.46.¹⁴ Greenville, the seat of Bond County in southwestern Illinois, was a small, crude, frontier community, not far from Vandalia and New Salem, where young Abraham Lincoln, the same age as Dr. Fitch, went in the same year, 1830, to start a career in a store. Thirty-five years later, Dr. Fitch would see the stricken president's remains in Albany, where the funeral car paused on its long, sad journey from Washington to Springfield. As bells tolled and cannons fired, Dr. Fitch would praise Lincoln, one of the greatest men he had ever seen.¹⁵

Dr. Fitch spent an unhappy winter in Greenville – one full of self pity. It was the "Winter of the Deep Snow," and living quarters were primitive. He boarded with the Berry family – "a school of scandal and laziness."¹⁶ The air in the house was almost as cold as it was outdoors because the building was only weather-boarded, and there were wide cracks in the walls.¹⁷ Dr. Fitch spent many hours before the fire twisting and turning, endeavoring to warm both front and back.¹⁸ Frozen apples did not make up for a deficiency of warm food, and recurring fits of the ague did not help his temperament.¹⁹

Dr. Fitch had hoped to establish himself as a frontier physician and a teacher to spread the new Eatonian gospel of science in American education. Professional ambitions, however, were frustrated by the presence of another physician, Dr. Drake, and another teacher, Mr. Pierce. Dr. Drake occasionally called upon Dr. Fitch to take a case, but Drake was too surly for this to be a comfortable arrangement.²⁰ Mr. Pierce organized a school before Dr. Fitch could, and the young doctor from the East was coolly received by the frontier people.²¹ Income opportunities were thus severely limited on the Illinois frontier.

Dr. Fitch took advantage of the slim opportunities that were afforded for religious, intellectual, and social interaction. Greenville needed a preacher, and Dr. Fitch went to hear the ones who visited the community.²² He was active in the formation and functioning of the Greenville Polemical Society.²³ The members discussed themes like government sponsorship of internal improvements, the permanency of republics, and the abolition of slavery. Of course, Dr. Fitch returned to courting the ladies, but he was critical of the local girls.²⁴ He found their minds unrefined and uneducated — in one case, “a wilderness more dark than groves of fir on Huron’s shore.”²⁵

For his favorite pastimes, literature and natural history, Dr. Fitch also found few opportunities. The frontier community was generally destitute of books, except for the Bible and the Methodist hymnbook, but there were opportunities to collect insects.²⁶ The budding entomologist must

have seemed odd in the crude frontier setting, as this description by the Honorable Elmer Baldwin of Farm Ridge suggests:

He wore a stove-pipe hat, the inside of the crown was well lined with entomological specimens, to which he added many during the day he spent with me. Some of the insects thus pinned to his hat were still alive and seemed to make very acceptable music for him. I learned much from him that I have never forgotten, and when he left I felt I had had a rich treat, and had parted with a man of very superior intelligence and knowledge.²⁷

The western adventure that began with such high aspirations ended as a misadventure in March of 1831, after only a few months of unexpected illness and ill humor. Dr. Fitch returned to Salem as soon as weather permitted travel.

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⁶*Ibid.*, 25 June 1830.

⁷*Ibid.*, 1 July 1830.

⁸*Ibid.*, 6 July 1830.

⁹*Ibid.*, 9-12 July 1830; M. M. Bagg (ed.), *Memorial History of Utica, N. Y., From its Settlement to the Present Time* (Syracuse, D. Mason and Company, 1892), Part 1, 632 pp.

¹⁰*Ibid.*, 25 July 1830.

¹¹*Ibid.*, 3 Aug. 1830.

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¹³*Ibid.*, 5 Aug. 1830.

¹⁴*Ibid.*, Diary 5, "Table of Expenditures."

¹⁵Anonymous, Asa Fitch, M. D., goes to the funeral of Abraham Lincoln, *Bull. Entomol. Soc. Amer.* 11(1965): 8 (furnished by Arnold Mallis from the Fitch Diary, according to editor); Diary, 25 Apr. 1865.

¹⁶Diary, 25 Dec. 1830.

¹⁷*Ibid.*, 15 Dec. 1830.

¹⁸*Ibid.*, 20 Dec. 1830.

¹⁹*Ibid.*, 22 Dec. 1830.

²⁰*Ibid.*, 8 Dec. 1830.

²¹*Ibid.*, 10 Dec. 1830.

²²*Ibid.*, 19 Dec. 1830, 5 Jan., 9 Jan., 30 Jan. 1831.

²³*Ibid.*, 6 Dec. 1830.

²⁴*Ibid.*, 18 Dec. 1830.

²⁵*Ibid.*, 25 Dec. 1830.

²⁶*Ibid.*, 14 Jan. 1831.

²⁷F. W. Goding, Three friends of New York agriculture, *Trans. N. Y. State Agric. Soc.* 50(1891): 358-366.



Back Home

Back home in Salem, Dr. Fitch participated in activities of the town lyceum and county medical society.¹ However, he wished he had nothing else to do but collect and describe insects.² Dr. Fitch was delighted and enthralled with the “French Encyclop. Manuels of Nat. Hist. & of Entomol.” that Dr. Freeman had obtained for him, but he feared that family worship had now become tedious because of this new entertainment. In his room he stayed up until eleven o’clock, cutting apart the leaves in various places and gazing upon the rich feast before his eyes. He thought to himself, “ ‘The die is cast.’ I am an Entomologist.”³

In November, Dr. Fitch moved to practice medicine in the nearby village of Fort Miller, where he also became active in another lyceum and returned to courting. This time, he met the girl he would marry, Elizabeth McNeil, — “the very one whom I have picked out for my *belli-bon* this winter. On her I calculate to inflict my attentions. I like Julia for her beauty — the charms of her countenance — but Miss McN. for her mind.”⁴ He took part in setting up a dancing school, and his father, again objecting on religious grounds, threatened him with separation from the family’s affection.⁵

On November 15, 1832, Dr. Fitch married Elizabeth McNeil, daughter of John McNeil of nearby Stillwater, New York. A more desirable opportunity for medical practice existed in Stillwater, so the couple moved there and soon started a family. In November of 1833 Elizabeth gave birth to a daughter, Sarah Elizabeth, and nearly three years later to a son, Charles Linnaeus. Dr. Fitch became deeply involved in the literary and scientific advancement of the community, instructing a class of young people in botany and actively participated in the Stillwater Lyceum, giving addresses on such topics as the importance of mental culture and the spirit of the times.⁶ The latter address, which he had already delivered before the Salem Lyceum more than five years earlier, was given in January of 1837. It was

an admirable exposé of the innocent, optimistic, and progressive American Victorian world in which he lived:

The present age is peculiarly characterized by a remarkable excitement upon the various objects which attract the attention of mankind. Not only is this a correct proposition with regard to religion, morality, benevolence, & charity, but it applies in almost an equal degree to all other things with which we are concerned. Literature, science, the useful & the polite arts, everything which has hitherto engaged “the heart & the hand” of man, is at present prosecuted with a zeal & a success unparalleled [*sic*] in all former ages of the world . . . A spirit of inquiry & research is abroad, beyond all former parallel — a spirit which in many departments of science & the arts has achieved results truly astonishing — & which instead of being satisfied with past success, only burns with increased ardour . . . Are not those days of Millennial [*sic*] glory, predicted in the divine oracles, evidently drawing near?⁷

Dr. Fitch continued with a discussion of the astonishing new modes of transportation being developed. He spoke of the romance in the notion of a railway a thousand miles long, of the delight in overcoming distance by art, and of the dream of flying. He spoke about mass communication and its rapid advancement in the past 50 years, particularly the improvements in printing presses and the use of steam to power them. He also mentioned advances in chemistry, natural philosophy, and, of course, natural history.

A half century has scarcely passed since the manes of the illustrious *Charles Linnaeus*, the prince of Natural Historians, were committed to the tomb. His philosophical investigations, his scientific arrangement, & perspicuous nomenclature



Dr. Asa Fitch (Courtesy Cornell University Libraries, Department of Manuscripts and University Archives).



Mrs. Elizabeth McNeil Fitch (Courtesy Cornell University Libraries, Department of Manuscripts and University Archives).

of the innumerable subjects of the 3 kingdoms of nature, gave these sciences an aspect entirely new, beautiful, & attracting. Let us render homage to Linnaeus! He was the first who made the study of Nature as alluring, as fascinating to the mind, as its objects are to the eye . . . His *Systema Nature* [*sic*] . . . strange as it may seem, contained brief descriptions of all the species of natural objects known in his time, amounting to upwards of 50,000 in number, & yet so perfectly arranged, that with a few minutes labor, any one species might be determined, having the specimen of it before us.

Natural History, & particularly Botany, has been a favorite study from that day to this; & the number of its species at present known, described, & arranged upon the plan of which he is the author, amounts to upwards of 150,000 . . . New species, & even new families, are daily adding to this number.⁸

In Stillwater, Dr. Fitch energetically pursued spiritual and moral interests as well. He was elected an elder in the Presbyterian Church and served as its clerk and usual representative at higher church meetings. He joined the

Stillwater Temperance Society and encouraged the drinking public to take the temperance pledge and use the "cold water cure" for drunkenness. Although he had been involved in the sale of demon rum while assisting at the general store in Salem, by 1833 Dr. Fitch was happy to declare that he would rather beg for food than obtain money from the sale of liquor.⁹

It might have been during this period that Dr. Fitch became involved with a society known as the Jolly Club. Its purpose was to occupy leisure evenings in relating tales and singing songs for amusement. "Begone dull care" was the club's motto. Alternatively, as called upon by the chairman of the evening, the members took their respective parts in the exercises. A standing rule dictated that if any member refused to tell a story or sing a song when called upon, he must sit on the dunce block for the remainder of the evening, and all the other members were to turn and grin at him every five minutes. Because of this severe penalty, few failed to take part when called upon. To become a member of the club, candidates had to relate a tale that kept everyone laughing for at least five minutes. Members were not allowed to snore unless the tale being told was insufferably dull.

And the Jolly Club, in the Jolly Club,
Be civil dear bub, or you'll get a snub,
A snub, or a drub, or a rub-a-dub-dub.
Hurra! hurra for the Jolly Club!¹⁰

Late in 1837, Dr. Fitch realized that a return to Salem was imperative. His father was aging and unable to attend to business and the family estate, and his brother James, who was not getting along with the elder Fitch, had decided to build a house on another part of the farm. In a letter to his brother, Dr. Fitch admitted to prospects of being a sorry sort of farmer until a few years of schooling familiarized him with the business. He worried that the local medical business would be small because the local inhabitants had all employed other physicians since 1834, when Dr. Freeman moved to New York City, where he became a homeopathist and acquired a fortune from his extensive business.¹¹ Furthermore, Stillwater offered Dr. Fitch many conveniences and good friends. However, he faced his predicament with characteristic philosophical optimism. It seemed that Providence had directed Dr. Fitch's return, and he acquiesced. He decided to go home in the spring of

1838 with a firm determination to promote harmony and friendship in the family. He recollected the thousands of incidences in life that cause pain and misery and felt it was unthinkable to add to them if not necessary.¹²



Dr. Fitch's home, Fitch's Point, Salem, New York (New York State Museum file photograph, dated September 19, 1900).

The farm consisted of some 600 acres, of which about 400 were as fine as any in the area. It was to be divided between Dr. Fitch and his brother, according to their father's will of about 1835.¹³ In many ways it was typical of farms before the advent of specialized agriculture. Much of the production went directly into family consumption, with the surplus sold for profit. A hired hand or tenant with whom the profits were shared was frequently employed. In 1866, Dr. Fitch reported that the farm products – pork, butter, potatoes, flax, and flax seed – brought in over \$1000, about the best ever. He attributed the success to his hired hand, Jim Mack.¹⁴ Dr. Fitch spent much time tending the farm and watching over the help, with which he was frequently displeased. David Palen, his assistant in the winter of 1842, was an indifferent hand. He apparently complained about everything – tools the worst he ever used, work the hardest he ever did, cows the most unruly he ever milked, and so on. He was slow, not stout enough for hard work, hated getting his feet wet, did not work in the evening, ate like a glutton, never went to bed until late, and hated to get up in the morning. Only necessity compelled Dr. Fitch to employ Palen as long as he did.¹⁵

Despite a heavy schedule of farm business, Dr. Fitch found time to take leading roles in local educational pursuits, lecturing on botany at the Greenville and Salem Academies in 1840.¹⁶ In 1842, at teachers' conventions in North Granville and Union Village, the doctor justified the introduction of natural history studies into the common schools.¹⁷ In January of 1843 he travelled through severe weather from Salem to Cambridge to deliver an entomological lecture to a local lyceum.¹⁸ Later that year an ap-



"The spirit of Temperance hovering over the fountain of pure water, looks mournfully upon him as though she would gladly restore him to happiness with the cup of life she holds" (From American Agriculturist 19:248[1860]).

pointment to Salem's new office of Town Superintendent of Schools, unwelcome because of an already crowded schedule, was accepted, and he endeavored to discharge the duties faithfully. Grammar had always been his dislike in school, so Dr. Fitch purchased a textbook with the idea of reviewing the subject thoroughly.¹⁹

Although Dr. Fitch instructed some medical students after returning to Salem, he soon gave up formal practice.²⁰ He regarded himself as too honest to compete with the quacks and charlatans in the profession because of his resolve to give medicine only when needed and only in doses needed.²¹ In 1847, he donated his saddle bags and remaining medicines to Robert H. Mack, who had decided to practice medicine at Crown Point.²²

Dr. Fitch, like many early naturalists, had to constantly struggle to justify the study of natural history. At the 1842 teachers' conventions he argued that natural history combined exercise with instruction, provided entertainment throughout life, and was a constant source of interesting conversation.²³ Dr. Fitch also embraced reasoning derived from natural theology. Victorian naturalists had a difficult time justifying their pursuit in economic terms, but moral and religious justifications allowed it to become popular early in the nineteenth century. Natural theology provided the rational and respectable reason, as well as the excuse, for studying nature. It enabled a human being to approach a closer knowledge of God while engaged in a rational amusement. Dr. Fitch told the teachers' conventions that natural history gives insights into the character and perfections of the Deity — that it is one of the best safeguards against irreligion. Natural theology taught that plants and animals possess many structures and contrivances allowing them to survive and propagate the species, and that elaborateness, so obviously designed, was irrefutable proof that there must be a Creator. According to Dr. Fitch, we study nature because it teaches us that God exists, and because in it we can see His beauty and perfection.²⁴

Similarly, Dr. Fitch explained to his friend George F. Horton why he was not an active abolitionist, although he did not favor slavery. He said the chief end of his existence was to glorify God and do good for his fellow creatures; that each individual must determine how he can best serve the purpose of Providence in placing him in this world:

I need not conceal my purpose from you — perhaps you anticipate it already. It is, to show to my fellow men what God is as revealed in his works, even in a minute & little regarded section of his works. Minute though they be, yet in clear & incontrovertible terms do they declare many of the attributes of their maker; & lead to ideas of him, so exalted, so sublime, infinitely beyond what the uninformed can conceive of. Mark the harmony that pervades all the works of nature — does it not prove that there is *one* God? who created all. Mark the immense number of species, their endless va-

riety of form, of color, of sculpture, of habits, — does it not declare the creator infinite — conceiving & planning, beyond the utmost stretch of ingenuity of all human intellect. Mark the evident pleasures & enjoyments given to every animated object, does it not bespeak the benevolence of the Deity — & his wisdom, & his power, in short all his natural attributes are here written in language which none can gainsay — 'tis evidence that there is a God — & that God the same of whom the Bible speaks which methinks none can resist. Be it my endeavor then to add my mite [might?] to that mass of evidence that declares the truth of the Scriptures — & show to my fellow men something more of the greatness & glory of that God in whom they live & move & have their being.²⁵

With a distinct sense of religious purpose, Dr. Fitch proceeded with his scientific interests, not settling on one subject initially but jumping from botany to zoology to geology. After a season of studying botany, he reflected upon his unsettled state and described himself as like a tree set on fire by lightning; eventually the paroxysm would subside, or some other monomania would replace it. He wished to burn with one thing at all times in order to accomplish something worthwhile. "But I am unstable as water. . . . Just like a jackass, turning up whatever road fancy's rein seems to draw. 'Now what a thing it is to be an ass,' as Shakespeare says."²⁶

Dr. Fitch's attention was turned to geology and literature while wandering in the foothills of the Adirondack Mountains. The view so inspired him with a poetic frenzy that at one point we see him wishing in his diary that he could settle on the spot and compose an epic poem describing the dramatic events that the globe underwent from the time of Creation to the advent of man.

What a grand theme! But who among the living or the dead is adequate to such a gigantic work. Not Homer, or Milton, or Pollock, could do full justice to it — & meetly tell of the rending of the rocks, the upheaving of the mountains, the terrific gaping clefts & fissures reaching the earth's centre, the floods bursting from sundered caverns; & all the inconceivably appalling [*sic*] spectacles that must have occurred, when this vast globe as if goaded by a thousand earthquakes was every where groaning & convulsed, & grinding with the pangs & throes & intensest agonies of a woman in travail.²⁷

Despite varied interests, Dr. Fitch concentrated on insects. His collection included well over 6000 specimens before he returned to Fitch's Point.²⁸ In Salem, his neighbors nicknamed him "The Bug-Catcher." It has been said that he was frequently seen after a shower, on his hands and knees, searching for all kinds of creeping things, and he would eventually return home with his tall hat completely

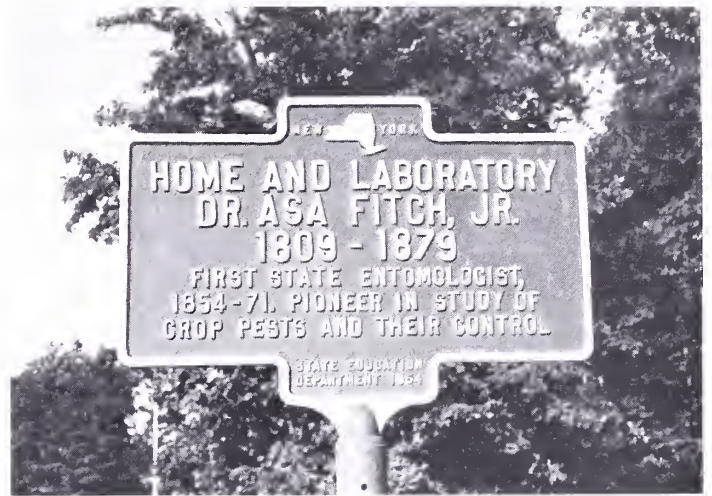
covered inside and out with “the writhing victims of his scientific greed.” He was such a zealous collector that many thought him demented; others complained that he destroyed more grain than his scientific investigations were worth. Even when engaged in family worship some felt it was not safe for an insect to attract his attention. One time, a peculiar moth alighted upon the Bible as he was about to begin reading. Glancing around, as if conscious of some impropriety, he picked up his net, caught the unusual specimen, and with a half-guilty look proceeded with the reading. The moth proved to be new to science.²⁹

As early as 1840, Dr. Fitch laid down a well-defined plan for his life’s work:

I have undertaken a very great work, and have laid upon myself a task both hard in the plan and difficult in the execution. To unite in one very limited body the most essential facts of the history of insects; to class them with precision and accuracy in a natural series; to delineate the chief traits in their physiognomy; to trace in a laconic and strict manner their distinctive characters, and follow a course which shall correspond with the progress of the science and the eminent men who have contributed to its advancement; to single out the useful and obnoxious species, those which from their manner of living interest our curiosity; to mark the thousand sources where the knowledge of the original authors may be consulted; to render to Entomology that amiable simplicity which she has had in the times of Linnaeus, of Geoffrey [Geoffroy?], and of the first productions of Fabricius, and yet present her as she is to-day, with all the richness which she has acquired from observation, but without surcharging her with it; to conform her, in one word, to the model which I have under my eyes, the work of Cuvier – such is the end which I have taken upon myself to attain.”³⁰



Dr. Fitch's office, sometimes known as the “bug house” (New York State Museum file photograph).



Historic marker indicating location of Dr. Fitch's home and office, Fitch's Point, Salem, New York.

For his natural history cabinets, Dr. Fitch outfitted the small medical office, a solid, well finished, frame building that Dr. Freeman had erected at Fitch's Point about 1822. Dr. Fitch had to get 20 yoke of oxen to move it nearer the house.³¹ He installed a chimney and cleaned, secured, and whitewashed the building. In the back room shelves on three sides held minerals, of which Dr. Fitch had over 3000 specimens, vials containing animals preserved in spirits, and the papers containing his dried specimens of plants. The fourth side of the room was occupied by glazed cases for birds and insects. The office was his pride and joy.³² During the first few winters back in Salem, Dr. Fitch had moved into the old barroom of the house. Later he occupied a back room, which was more convenient for his comfort and enjoyment, with desk and bookcase at hand. The window afforded a view of the farm and allowed him to inspect the hired help. His wife Elizabeth, however, disliked the change of rooms because of the cramped quarters and the clutter of natural history specimens.³³

Elizabeth had been brought up by Puritan grandparents. Her mother, who had eloped with an Irish officer, died after Elizabeth was born, and her father returned to Ireland. The outraged grandparents discouraged any tendency toward Irish wit and gaiety. Consequently, the household at Fitch's Point retained many Puritan ways, including family prayers, grace before meals, and strictly observed Sundays. As Dr. Fitch's absorbing interest in the natural sciences intensified, his delicate wife became a strict disciplinarian and a characteristically neat and economical New England housekeeper. She did not like having her orderly house cluttered with specimens, and he was not happy with the dark rooms and excessive cleanliness. Elizabeth eventually learned that such neatness was not compatible with a growing family and many scientific guests.³⁴ Abby Martin was born in 1840, Anna Olivia in 1844, Elias Pattison in 1847, and Asa James in 1852.³⁵ During the Civil War, the eldest daughter, Sarah, moved back to Fitch's Point

from Mississippi with her two children and three stepchildren.³⁶ The conditions soon crowded Dr. Fitch from his home, and he began sleeping on a settee in the office.

In the office, the mice sometimes made so much noise – rattling among papers, jingling vials, and jumping on the floor – that they kept Dr. Fitch awake until he improvised traps.³⁷ The settee often became so infested with voracious bedbugs that he was unable and unwilling to sleep upon it. His solution was to place the settee in the corn crib until all the creatures were starved out, or to treat their lurking places with a quarter ounce of corrosive sublimate.³⁸ He worried that the poison absorbed through his skin caused constant cracks in the corners of his mouth.³⁹ The office became cluttered with piles of newspapers, shreds of writing paper, unused labels, fallen pins, and other rubbish as Dr. Fitch worked assiduously on his scientific research.⁴⁰

As a student, Dr. Fitch had experimented with the number of hours of sleep needed to maintain a healthy body and mind. Five hours nightly proved sufficient, and he constantly sat up until midnight or later and arose at daylight.⁴¹ Lights in the “bug house” were frequently seen by passers-by. One evening in 1866, Dr. Fitch overheard some men riding by remark, “There’s always a light there” – alluding to his office, and he supposed there was no other window along the road in which the travelers saw a light so constantly and so late at night.⁴²

Conscious of his vulnerability alone in the office in the still, dark night, Dr. Fitch began to fear attack by a “desperado.” He even had occasional dreams of being assaulted. In 1868, he purchased a revolver – “a pocket ‘seven shooter’ – silver mounted – made by Smith & Wesson . . .” – that he kept under his pillow.⁴³

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²¹Diary (Memorandum book of farm), 17 Feb. 1842.

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²³Fitch, Report, pp. 2-14.

²⁴*Ibid.*, p. 11. The fullest and most influential exposition of natural theology was William Paley’s *Natural Theology: or, Evidence of the Existence and Attributes of the Deity, Collected from the Appearances of Nature* (Philadelphia: John Morgan, 1802). In the United States, it was one of the most widely used college texts, and as late as 1885, Thomas Gallaudet’s children’s adaptation of Paley, *The Youth’s Book on Natural Theology* (New York: American Tract Society, 1832) was still popular.

²⁵Diary, 18 Feb. 1840 (letter to Horton).

²⁶*Ibid.*, 24 Aug. 1840 (letter to Horton).

²⁷*Ibid.*, 20 Sept. 1839.

²⁸Dr. Fitch labelled nearly all of his specimens with individual numbers. He recorded these numbers consecutively in four individual registers, along with collecting dates, localities, and other pertinent information. Label numbers in black ink written on white paper are recorded in one register of specimens from New York State. Label numbers in black ink crossed with one or two red lines and written on white paper are recorded in a second register of specimens from New York State. One red line indicates a number less than 10,000, and two red lines indicate a number to which 10,000 should be added. Label numbers in red ink written on white paper are recorded in a third register that lists specimens from elsewhere in North America. These three registers are in the possession of the New York State Museum. The fourth register, owned by the Museum of Science, successor to the Boston Society of Natural History, lists specimens from elsewhere in the world. The corresponding labels are written in black ink on colored papers.

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More Scientific and Agricultural Developments in New York State

While Dr. Fitch was becoming ensconced in the rural life and building a family in Salem, the movement for government-sponsored internal improvements was swelling in Albany. Political philosophers believed social and material leadership would bless the new nation if the sciences, especially the natural sciences, were applied to the common purposes of life. Although Europeans led in descriptive natural science, national pride dictated that Americans study America's natural productions. As the nation grew, agriculture expanded rapidly and scientific principles were applied to its improvement. After the invention of the steam-powered printing press in 1811, a new and thriving agricultural press brought new developments to the attention of a wide readership. The tradition of scientific amateurism gave way as the public, especially through the auspices of scientific and agricultural societies, lobbied for governmental support of scientific and agricultural surveys.

Governor Clinton repeatedly asked the New York State Legislature to encourage mineralogical research, particularly with a view to discovering coal. In 1813, Theodoric Romeyn Beck, in the annual address before Albany's Society for the Promotion of Useful Arts, had indicated that much unnecessary expense had been incurred in the search for coal because of the miners' ignorance.¹ During the 1829 legislative session, the Lyceum of Natural History of the City of New York presented a petition to the Legislature requesting an inquiry into the expediency of searching for coal in the State.² In 1834, the Albany Institute, under the presidency of Stephen Van Rensselaer, petitioned the Legislature for financial assistance to form a "grand and comprehensive collection of the natural productions of the State of New York, to exhibit at one view and under one roof its animal, vegetable, and mineral wealth." The Institute felt that valuable sources of wealth might be discovered. Furthermore, the Institute indicated that such collec-

tions are an object of national pride in every civilized country in Europe and that, as the French naturalist Cuvier pointed out, "Natural History is one of those sciences, in which genius is impotent, unless seconded by power, and the efforts of power vain, unless its results are arranged by the co-operation of genius."³

On April 18, 1835, a select committee reported to the State Assembly on a memorial from the American Institute of the City of New York, through which a natural history survey of the State was requested. The memorialists felt such a survey was too onerous to be undertaken by individual enterprise and too expensive to be reasonably expected from private scientific institutions.⁴ That same day, the Assembly resolved to request the Secretary of State, General John A. Dix, to report on the most expedient method of obtaining a complete geological survey of the State, "which shall furnish a scientific and perfect account of its rocks, soils and minerals, and of their localities, a list of all its mineralogical, botanical and zoological productions, and provide for procuring and preserving the same. . . ."⁵

Many years later, General Dix's son recalled the effects the extensive legislative instructions had on the Dix household. The General, delighted with the character of the work, began at once to collect information on natural history.

The house was soon flooded with books on geology; Lyell, Mantell, and other authors appeared, and we children used to wonder at the plates representing incomprehensible monsters (the Plesiosaurus, the Megatherium, the Pterodactyl, and heaven knows what other shapes), which far more awful than any in the "Arabian Nights," confronted us as we peeped into those mysterious volumes. The General became an enthusiastic student of these works, and enlisted the family for the

same pursuit. He entered into correspondence with the persons then looked up to as authorities in physical science; he was knee-deep in rocks and minerals, organic remains and alluvial detritus, and the treasure of the animal and floral kingdoms.⁶

The thorough and impressive report resulting from General Dix's work effectively pointed out the practical and scientific objectives of a State geological and natural history



John Adams Dix (From M. Dix, Memoirs of John Adams Dix [1883]).

survey, and indicated that practical utility is the principal motive to support one. Concerning entomology, General Dix pointed out that Dr. Harris' contribution to the natural history survey of Massachusetts was merely a list of insects found in the State, and that the New York State Assembly's 1835 resolution only required a complete list with a full series of specimens.⁷ "Yet in connection with such an account of the entomology of this State, as a part of its natural history, certainly no considerations are of greater importance than those which relate to economical purposes." He pointed out that the destructiveness of insects to vegetation was rarely considered, but that many of their devastations could undoubtedly be guarded against by a better knowledge of their habits.⁸

The General's report influenced the State Legislature to appropriate \$104,000 for a four-year Geological and Natu-

ral History Survey. The governor was directed to employ a suitable number of scientists to make an accurate and complete geological survey of the State. Without hesitation, Governor Marcy signed the bill into law on April 15, 1836.⁹ Funding was later extended for two more years.

Governor Marcy considered the magnitude and importance of the work. On the advice of Amos Eaton and Edward Hitchcock, a respected New England geologist, New York State was divided into four geological districts. Scientific appointments were made after consultation with a group of advisors that included General Dix, Stephen Van Rensselaer, Dr. T. R. Beck, Professor Eaton, and Edwin Croswell.¹⁰ Army engineer William Williams Mather, Rensselaer School Junior Professor Ebenezer Emmons, conchologist Timothy Abbott Conrad, and Paris-trained geologist Lardner Vanuxem were appointed principal geologists. Dr. Lewis C. Beck was appointed mineralogist; Dr. John Torrey of New York, botanist; and Dr. James Ellsworth DeKay of Long Island, zoologist. After the first year of field work, Conrad was appointed the survey's paleontologist, and Mr. James Hall, a Rensselaer School graduate who had been Emmons' field assistant, was placed in charge of Conrad's geological district. Hall chose his Rensselaer School classmates George Boyd, Ezra Carr, and Eben Horsford as his field assistants.

Thus a scientific community developed in the capital district of New York State. Earlier in the nineteenth century, DeWitt Clinton had combined elements of the practical and the theoretical, the political and the scientific, and he persuasively advocated public promotion of science. The natural history survey, which eventually resulted in the 30-volume series entitled "Natural History of New York," has been called "certainly the most sweeping collective effort of American science in the nineteenth century."¹¹ It earned the approval of politicians and scientists alike and catapulted many of the staff scientists into national and international fame.

With the development of the new scientific community came many other significant developments. The survey geologists met regularly to exchange ideas and coordinate their work. In the fall of 1838, they met at the home of Dr. Emmons in Albany and discussed means of consulting with geologists in other states. At a second meeting at Dr. Emmons' home the next fall, a formal meeting was called for Philadelphia in April of 1840. At that meeting the Association of American Geologists was organized. Eventually, naturalists also wished to join the association, and in 1847 the American Association for the Advancement of Science was formed as an outgrowth of the earlier organization.¹²

James Hall, who had been a member of the Association from the outset, was instrumental in bringing its 1851 summer meeting to Albany. Professor Louis Agassiz, who had arrived at Harvard from Europe in 1846 and had assumed considerable authority as the arbiter of American science, was then president of the organization. The meeting was an exciting occasion for the people of the Albany area, and

the city proved a generous host. James Hall used the meeting to gain support for a proposed University of Albany, which had received legislative approval and had been granted a charter earlier that year. The University was envisioned as a project of national scale – an ideal institution of European character that would promote both literature and science. The effort to advance the project was continued for several years through public meetings, appeals for State support, and preliminary offerings of lecture courses. The ambitious plan called for a first-rate faculty, including James Dwight Dana, John P. Norton, Benjamin Peirce, and even Louis Agassiz.

Early in 1852, it was announced that the University was in operation with law and medical departments and that money was available for an observatory. The scientific department was ready to offer courses stressing practical application: agriculture, engineering, chemistry, mineralogy, metallurgy, mining, and astronomy. Pleas for aid and encouragement continued, but the legislative proposal failed, despite the existence of the University's charter. Only the schools of law and medicine, and the privately endowed Dudley Observatory, materialized. The observatory was ready for inauguration in 1856, when the American Association for the Advancement of Science, with James Hall as president, again met in Albany. The occasion corresponded with the dedication of the new State Geological and Agricultural Hall. The institutionalization of the American scientific community, aided by many of Amos Eaton's intellectual offspring, was making substantial progress, even though the major national university project proved premature.¹³

Meanwhile, there was renewed interest in State aid for the promotion of agriculture. The State Board of Agriculture had ceased to exist in 1826 by a limitation of the 1819 law that created it. Soon many of the county agricultural societies also failed. However, in 1832 a convention of delegates and other interested citizens from the various counties was invited to meet in the Assembly Chamber in Albany. The New York State Agricultural Society was formed, a constitution was adopted, and the Society began planning its work. Reports were prepared on plans for an agricultural school, an experimental farm, a weekly agricultural paper, and an agricultural fair. The Society was incorporated by legislative action in 1836, and members besieged the State Capitol each year, pointedly meeting in Albany while the Legislature was in session. In 1841, the lawmakers capitulated and granted a substantial appropriation for agricultural improvements. The policy of State aid for agricultural improvements was revived, and a sum of \$8000 a year for five years was appropriated with \$700 going to the State Society and the remainder to the county societies.¹⁴

In 1842, the governor essentially abolished the Geological and Natural History Survey. Five years of field work on foot and horseback had been completed; the Survey had yielded much unsuspected new information, which was

summarized in the four final geological district reports. Dr. Beck finished his final report on the mineralogy of the State, and Torrey and DeKay finished their reports on the botany and zoology of New York, respectively. Conrad, however, had failed in his duties, and there was no final report describing the fossils, although a representative collection was at hand. Also, no provision had been made for a report on the agriculture of the State, although this had been designated a subject of major interest in General Dix's plan for the Survey. Only James Hall and Ebenezer Emmons remained available in Albany to complete the work. They competed to persuade the Legislature to allocate funds to collect, study, describe, and publish on New York's wealth of fossils. In 1843, the governor was authorized to continue the various departments of the survey to ensure its completion as outlined in Dix's plan. Hall was appointed paleontologist and Emmons agriculturist.



James Hall, 1843 (New York State Museum file photograph).

James Hall devoted himself unremittingly to the Survey. His attributes as an astute observer, keen scientist, and prolific writer, with his inflexibility of purpose and dynamic personality, made Albany a mecca for aspiring paleontologists. In 1857 he built, at his own expense, a brick building – an apprentice school – to which would-be paleontologists, artists, draughtsmen, and collectors mi-

grated. European and American scientists made their way to Albany to meet Hall. Occasionally, however, the State reduced or suspended Hall's financial support. He advocated the establishment of a permanent natural history project and formulated an ideal and proper relationship between state and science: that scientists should be exempt from political manipulation and have every facility afforded for their progress. Eventually, his ideals were realized, and science became secure in governmental support.¹⁵



Ebenezer Emmons (From American Geologist 7:1[1891]).

But Ebenezer Emmons was not endowed with the singleness of purpose that possessed Hall. Although an indefatigable geologist of considerable renown, his interests included medicine, agriculture, chemistry, and natural history. Unlike the determined and headstrong James Hall, he was nervous, sensitive and deeply religious. Hall, who never compromised high ideals in favor of a tranquil environment, was constantly surrounded by an atmosphere of anxiety.¹⁶ Emmons and Hall were at odds nearly from the time they first met.

Nevertheless, Emmons attempted to make the most of his new position. From 1846 to 1855 he produced five quarto volumes on the agriculture of New York, treating such subjects as soils, climate, fruits, and insects. The position also allowed him to surreptitiously present to the pub-

lic a full exposition of his ideas on the Taconic System, which led to one of the most bitter controversies in geological science. In his 1846 volume on the agriculture of New York, Dr. Emmons included a lengthy treatment of his novel notions on the Taconic System of rocks in eastern New York.¹⁷ His friend Asa Fitch had discovered two new fossil trilobites in Washington County; they seemingly were more ancient than any known, thereby representing an earlier chapter in the history of life on earth.¹⁸ From this evidence, Dr. Emmons inferred that the Taconic rocks were older than any known fossil-bearing rocks from New York. Conrad and Vanuxem agreed; Hall intensely disagreed. Supported by William Mather, James Dwight Dana, William B. Rogers, and Henry D. Rogers, Hall argued that the Taconic rocks were merely deformed equivalents of the rocks to the west. The Taconic controversy raged for years, eventually overshadowing Emmons' major contributions to geology.

The enmity between Emmons and Hall grew when, in autumn of 1849, Hall was made aware of a proof sheet of a geological chart in the office of the Superintendent of Public Instruction. The chart, which had been prepared by James T. Foster, a schoolteacher from nearby North Greenbush, failed to mention the New York formations. Moreover, Hall had never heard of the audacious fellow who prepared it. He sent the chart to Louis Agassiz, who, always sensitive to the dignity of American science, was equally outraged. Letters of condemnation from both men were printed in the Albany newspapers, and Foster attempted to sue the scientists for libel.

Meanwhile, Dr. Emmons endorsed a quickly revised edition that included his Taconic System, and the chart was copyrighted, printed, and shipped to New York to be marketed to the State's schools. However, Hall apparently boarded the same boat that was to carry the shipment, and the charts never reached their destination. Professor Agassiz's court case was called, after many delays, in March of 1851. A preponderance of scientific talent supported Hall and Agassiz, including William Mather, Sir Charles Lyell, James Dwight Dana, the Rogers brothers, Edward Hitchcock, Eben Horsford, and Joseph Henry; only Dr. Emmons went to Foster's aid. The trial lasted for several days and ended in a nonsuit. Hall's case was never called. Emmons' scientific reputation emerged battered. With most influential scientists against him, he was effectively excommunicated from the ranks of American science. He remained for a while in Albany to work on his agricultural reports, but soon moved to North Carolina, where he accepted a position as State Geologist.¹⁹ Ironically, Emmons' interpretation of the Taconic System has proven to be accurate.

As its scientific and agricultural communities developed, Albany's publishing industry was becoming prominent. For much of the nineteenth century, New York's capital city was second only to Boston in the number of books produced. In 1828, the first steam-driven printing press in the

United States was installed in Albany.²⁰ Government documents, including the natural history reports and the State Agricultural Society's *Transactions*, were major sources of business for the Albany publishing industry, and as it developed, agricultural publications proliferated. Agriculture was the cornerstone of the American economy, and Albany was at the hub of American agriculture. Situated at the confluence of the Hudson and Mohawk Rivers, the city was a natural funnel for the flow of people moving westward and for western produce moving eastward. The funnel became enlarged with the completion of the Erie Canal in 1825 and the spread of the railroad network in the succeeding decades. It was only natural that Albany would become an agricultural center of growing importance.

After the invention of the steam-powered printing press, inexpensive and popular newspapers, magazines, and other vehicles for disseminating useful knowledge multiplied, particularly those dealing with agriculture. The popular literature became filled with prescriptive writing as didactic Victorian authors sought to elevate and instruct their audiences. The farm papers battled with old superstitions, like "moon farming" and the belief in the transmutation of wheat to chess, a common weed in grain. They helped break down the prevalent opposition to "book farming," fostered scientific farming, and exposed swindlers who preyed upon the rural communities.

The beginning of agricultural journalism is usually dated April 2, 1819, when the successful *American Farmer* was inaugurated in Baltimore. Two months later, the *Plough Boy* was initiated in Albany. In the following decades, agricultural journals sprang up all around the country. It has been estimated that in the antebellum period more than 400 such journals were initiated. Most of them were short-lived, but the successful ones had a profound effect on the direction of American agriculture. On the eve of the Civil War, the circulation of the farm press was estimated at more than a quarter of a million.²¹

Two of the most influential farm journals were the *Cultivator* and the *Country Gentleman*, published in Albany. In 1834 the New York State Agricultural Society authorized publication of the *Cultivator*. After the first year the journal was turned over to Jesse Buel as sole editor and conductor, and under his lead it attained a prominence equalled by few farm papers in any part of the world. In many respects, the *Cultivator* was ahead of its time in stressing scientific farming and encouraging agricultural education and governmental support for agricultural improvements. To this end, Buel enlisted the aid of more than 200 correspondents of varied backgrounds. After Buel's death in 1839, Luther Tucker purchased the *Cultivator* and united it with the *Genesee Farmer*. Tucker advocated the establishment of agricultural experiment stations and introduced new departments on subjects like horticulture, veterinary science, poultry science, and entomology. In 1853, realizing that rural life was diversifying beyond the scope of the *Cultivator*, he inaugurated a weekly entitled the *Country Gentleman*,

which acquired a national and international flavor. The *Cultivator*, its price reduced, was henceforth composed of articles selected from the new journal. In 1866 the two papers merged.²²

Another significant nineteenth century development in Albany was the establishment of a State Cabinet of Natural History. The early memorials to the Legislature from the New York Lyceum of Natural History, the Albany Institute, and the American Institute all indicated a desire for a comprehensive collection of the State's natural productions. In his report to the Legislature on the feasibility of a geological and natural history survey, Secretary of State Dix stated that a large room would be necessary for a cabinet in which to preserve specimens collected by survey scientists, and he recommended joining two committee rooms in the Capitol for this purpose.²³ The 1836 law creating the survey directed that specimens be deposited in the State Library, but it was quickly realized that the library would be insufficient.²⁴ In his first annual report of the first geological district, William Mather suggested erecting a building to accommodate the survey's collections. "A State Museum of Natural History, like the British Museum, the Jardin des Plantes, or others in Europe, would do honor to the State, and be an example worthy of imitation by others."²⁵ Unfortunately, his entreaty fell on deaf ears in the Legislature.

Late in 1839, DeKay, Vanuxem, Emmons, Mather, Conrad, Hall, and Beck addressed a memorial to Governor Seaward, recommending use of rooms in the old State Hall as a museum. The Governor communicated their memorial to the Legislature early in 1840.²⁶ Later that year, the Legislature provided that the old State Hall be refitted for a State Museum in which to arrange and display specimens and other materials obtained by the survey scientists.²⁷ By 1843, the transfer of specimens from the committee rooms of the Capitol was complete.²⁸ That same year, also the year in which Dr. Emmons was appointed to make an agricultural survey of the State, the State Agricultural Society was granted quarters in the old State Hall, and it started a library and agricultural museum.²⁹ In 1845, the Regents of the University of the State of New York were directed to provide for the safekeeping of the cabinets of natural history and to hire a curator, and the State Agricultural Society was granted free use of the cabinets subject to the regulations of the Regents.³⁰

In 1854, the Legislature authorized the repair and enlargement of the old State Hall for the better arrangement of the expanding State Cabinet of Natural History and the accommodation of the State Agricultural Society and its museum.³¹ It was soon found that the building, built in 1797, was unsafe for any additions, so the Legislature authorized its destruction and the erection of a new State Geological and Agricultural Hall.³² The new building was dedicated to the cause of science on August 27, 1856, the occasion corresponding with the Albany meeting of the American Association for the Advancement of Science. More than 5000 people were present, accommodated un-



State Geological and Agricultural Hall (From P.A. Chadbourne & W.B. Moore [eds.], The Public Service of the State of New York, vol.III [1882]).

der a tent in Academy Park. On the stage sat the governor and other prominent politicians, prominent American clergymen, scientists, and a host of other dignitaries. More than 25 flags bearing titles of fields of human endeavor that made great strides in America during the Victorian Era – from geology, zoology, botany, and agriculture, to the press, steam, commerce, and art – were suspended over the stage.

Professor Agassiz was introduced and received enthusiastically. He spoke of the occasion as one of great interest for men of science and reminded the audience that when European geologists came to America they at once asked for directions to Albany. Professor Hitchcock, renowned for his role in the pioneer geological survey of Massachusetts and as ex-President of Amherst College, then stated that this was the first occasion in which a state government in America had erected a natural history museum. He believed Albany was the best place in the country to build the first geological hall because Albany County was the district where the first agricultural and geological survey was undertaken on this side of the Atlantic, if not in the world.³³

The new hall was dedicated to the cause of agriculture on February 11, 1857, at the annual meeting of the State Agricultural Society. This was an auspicious occasion for American agriculture. The Society and guests, including the governor and lieutenant governor, various State officers, the Senate, and the Assembly, were richly entertained in the upper rooms. The group later assembled in the Society's spacious lecture room to hear remarks from various political and agricultural leaders: Benjamin Pierce Johnson, an internationally renowned agriculturist, ex-President and incumbent Corresponding Secretary of the Society – and its leading spirit for many years; Samuel Cheever, President of the newly established New York State Agricul-

tural College; T. C. Peters, the assemblyman who introduced the original bill asking for expanded and improved accommodations for the Society; William Kelly, a member of the Senate and ex-President of the Society; and Governor John A. King, also an ex-President of the Society.

Eloquent addresses extolled the virtues of farming, the prominence of New York State agriculture, and the international leadership that the State Agricultural Society had taken in its efforts to scientifically improve agricultural practices and spread the new practices through various educational media, including fairs, exhibitions, publications, lectures, and reports on Society-sponsored investigations into scientific agriculture. It was asserted that the State's and the Society's international reputations in agriculture were firmly established with the dedication of a new hall designed and built for the combined purposes of science and agriculture.³⁴

Indeed, the State Agricultural Society, like the State Cabinet of Natural History, soon proved worthy of the new edifice. The Society continued for many years as a national and international leader in the encouragement of scientific agriculture, agricultural education, and state and federal aid to agricultural institutions. A pioneer in agricultural progress, it was the inspiration for many other organizations; it lived through and played a major role in shaping a far-reaching agricultural revolution.³⁵ The new hall provided commodious space for offices, lecture facilities, an impressive library of thousands of foreign and domestic volumes, and an unsurpassed agricultural museum containing farm and home implements, seeds, minerals, pest insects, and many other curiosities from home and abroad.

The State Cabinet of Natural History went through many changes mandated by the State Legislature. In 1865, the Legislature, recognizing the great credit that the work of the Geological and Natural History Survey conferred upon the State, passed a resolution asking the Regents of the University to report on the means needed to maintain the Cabinet as a complete museum of natural history. The Regents sought the advice of prominent scientific men, including Alexander Agassiz, James Dwight Dana, and James Hall. They recommended Hall's plan for regarding the Cabinet as a series of collections in natural history that were to be increased and elaborated. The result of his well-conceived plan was immediate. He was appointed Curator and authorized to carry out his plan, which was supported by increased appropriations. Hall was now official head of two State departments of science – both contributing to the same end but independent in responsibility.³⁶

In 1870, the State Legislature passed an act in which the State Cabinet was reorganized as a museum of scientific and practical geology and general natural history, to be known as the New York State Museum of Natural History. Hall was appointed Director and given power to appoint assistants or curators with the concurrence of the Regents, and for the first time an annual appropriation was made for salaries and the augmentation and preservation of the col-

lections.³⁷ The Museum has evolved in organization, operation, scope, and facilities, and today it is a general museum — the New York State Museum. It is a reminder of the great legacy of pioneering work in the natural sciences that was encouraged and sustained by an inimitable interaction between political philosophers and scientists.

The Geological and Agricultural Hall became a favorite attraction for visitors. One journalist described its popularity in the *New York Weekly Tribune* of May 19, 1860:

These rooms, as they well may be, are now not only a resort for denizens of the city to while away a leisure hour in surveying the treasures they con-

tain, but the traveler, as he passes by and through Albany, puts down "a visit to the Agricultural and Geological Rooms" as one of the indispensables of his jaunt. They have become the resort of thousands each year, not only of the State of New York, but of all States and of all countries whose citizens visit our shores. Not only the farmer calls to make inquiries in this repository of the treasures of his calling, and the mechanic to witness the progress of art, but here, too, is the storehouse where the student of every profession may gather wisdom and treasure up instruction.³⁸

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Dr. Fitch's Early Professional Involvements With the Scientific and Agricultural Community

Dr. Fitch watched the development of the Albany-based scientific and agricultural community with interest. He applied to Governor Marcy for the zoology post on the



James Ellsworth DeKay (From H.L. Fairchild, A History of the New York Academy of Sciences [1887]).

newly created natural history survey, proposing to spend summers in the field and winters with the European collections.¹ The Governor, however, favored James DeKay, a Long Island physician and zoologist with European training. In 1839, Dr. Fitch wrote DeKay to arrange an entomological assignment, but DeKay never responded.² Instead, he engaged the services of T. W. Harris in surveying the insects.³ DeKay eventually chose not to treat the insects, though they were specifically mentioned in General Dix's survey plan as a group requiring study, and DeKay himself emphasized pest control to justify public funding for the study of zoology.⁴ The zoological field was so vast that he could not complete the survey in the period stipulated by law.⁵ Also, his health failed in 1841, and he never fully recovered.⁶

After Dr. Emmons was appointed State agriculturist in 1843, he immediately found an opportunity to fully expose his theory of the Taconic System in a volume on the agricultural geology of the State. However, he was soon impelled to write about fruits and vegetables, and finally to treat the insects. James Dwight Dana did not fail to make fun of the "Pomologist" after the Foster trial. Others wanted to do the insect survey. The talented entomologist Samuel S. Halderman even asked for the curatorship of the State Cabinet and the respected John L. LeConte felt he should have a share in the work. However, Emmons proceeded with it.⁷

Apparently as a result of his newly found interest in agriculture, Dr. Emmons, in partnership with Alanson J. Prime, a physician who graduated from the Rensselaer School in 1829, initiated the *American Quarterly Journal of Agriculture and Science* in Albany. Its purpose was to "multiply the means of increasing the products of the earth." To this end, Emmons and Prime engaged contributors with scientific and practical expertise, pledging payment for their efforts.⁸ Dr. Fitch, who Emmons knew from his days at the Rensselaer School, was to write a series of articles

on injurious insects.

Wheat, the most important esculent in North America from the time Europeans first settled the land, was an important export item even in the seventeenth century. It was the chief crop in New York State from its settlement until the Erie Canal and railroads brought a cheaper and better product from Ohio and the western states; even then it continued to be an important crop. Because of competition with the West, New York wheat growers improved their cultivation methods. Soil exhaustion, diseases, and insect pests forced wheat cultivation, which in New York began on Long Island, up to the river flats of the Hudson, then to the Mohawk, and finally to the famous Genesee Valley, which for a generation held the title "Granary of the Country." Between 1830 and 1840 the wheat midge and Hessian fly became so destructive that wheat growing almost ceased in eastern New York. It would be 10 or 15 years before successful control methods would allow a revival of wheat culture in central and eastern New York.⁹

It is not surprising that Dr. Fitch wrote his first three entomological articles on the wheat midge, Hessian fly, and related insects. In his first article, "Insects of the Genus *Cecidomyia*, Including the Hessian and Wheat-fly," published in 1845 in the first volume of Emmons' *Journal*, he proposed to deal with a group of insects that "justly ranks

first in importance in the consideration of the tillers of our soil." He thus set for himself a goal for the next three decades — to present information on the taxonomy, ecology, destructiveness, and control of injurious insects in such a way that it would be useful to common farmers as well as scientists.¹⁰

In his second article, "The Wheat-fly," Dr. Fitch reviewed the history of the pest problem. He had briefly visited the eminent entomologist and Harvard librarian Thaddeus William Harris to gather information on the pest.¹¹ At his isolated home in Salem, he had few contacts with men of science, except the geologists in Albany, and was forced to copy from books borrowed from those with similar interests. A problem similar or identical to the American wheat fly (wheat midge) had existed periodically in Europe since the last half of the eighteenth century. Dr. Fitch found that it had been widely noticed in the agricultural papers, particularly the *Cultivator* and the *New England Farmer*, and that the identity of the wheat fly was in question. Some regarded it as an "animalcule of the *Vibrio* genus, analogous to the 'eels' generated in vinegar and paste," whereas others pronounced it a weevil or considered it the Hessian fly. It apparently started its ravages in northern Vermont about 1828 or 1829 and then spread from there until wheat culture around Salem was generally abandoned by 1832.

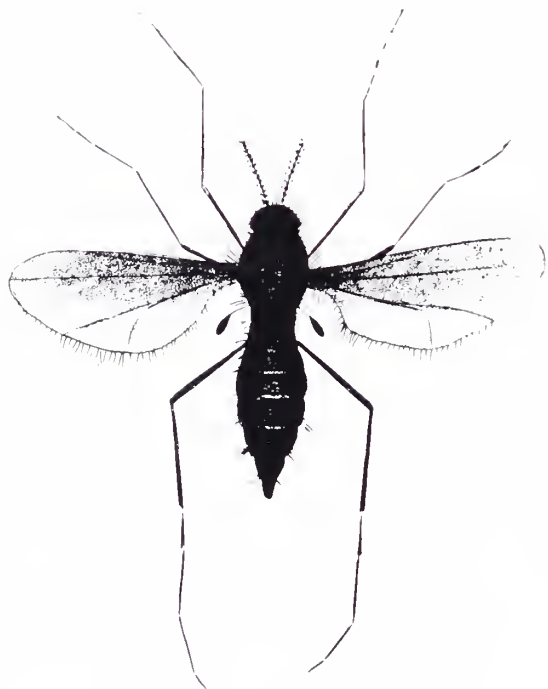


Illustration of the willow beaked-gall midge, *Mayetiola rigidae* (Osten Sacken), from Dr. Fitch's first entomological article (Engraved by J.E. Gavit, from American Quarterly Journal of Agriculture and Science 1:pl.2 [1845]).

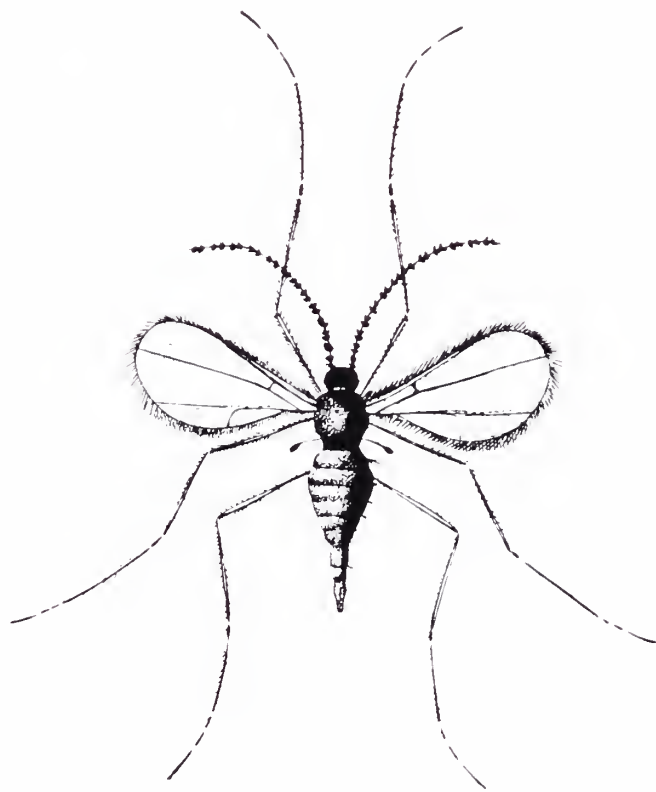


Illustration of a female wheat midge, *Sitodiplosis mosellana* (Géhin), from Dr. Fitch's second entomological publication (Engraved by J.E. Gavit, from American Quarterly Journal of Agriculture and Science 2:pl.5 [1845]).

In the Genesee country, he noted, it was not detected until 1845.

Dr. Fitch then noted that the wheat fly problem went through somewhat regular cycles, lasting only one or two years before diminishing. He concluded that reduction of the fly's population was attributable to that "beautiful provision of nature. . . that an undue increase in any of the species of the animal or vegetable world never takes place, without being speedily succeeded by a corresponding increase of the natural enemies and destroyers of that species, whereby it again becomes reduced to its appropriate bounds." This reasoning led him to another important conclusion — that the entire life history and habits of the insect must be carefully investigated to enable the intelligent development of control measures. Dr. Fitch would develop this approach to pest problems to a high level in coming years. He would study many possible methods of control but always emphasize that a full knowledge of life histories provides the best hints for reducing pest populations.

Lantern in hand, Dr. Fitch visited infested fields at night and found myriads of flies "busily hovering about the grain. . . dancing, as it were, slowly up and down along the ears, intently engaged in selecting the most suitable spot where to deposit their eggs." The female "toils industriously to insinuate its ovipositor through the scale," deposits eggs, and then she is left with the laborious task of withdrawing her ovipositor. ". . . The energies of the insect are sometimes inadequate, and it remains, Prometheus-like, chained to an immovable mountain, until it expires."

Dr. Fitch traced the insect's life cycle from the egg to the larva, which feeds on developing grain, to the overwintering "dormant larva," to the spring pupa, and back to the adult. He then reviewed the known natural enemies of this tiny creature — birds and one species of parasitic wasp in America and four or more species of wasps abroad. Could these be manipulated to control the pest? Artificial control methods then in use seemed ineffectual, if not ludicrous. They fell into two categories — those that protect the grain from the fly and those that destroy the fly. The use of smoldering fires or brimstone to repel the insects was discouraging because of the amount of labor involved. Someone suggested suspending yarn impregnated with fluid from the scent glands of skunks in wheat fields to repel the flies. "I imagine that in carrying this suggestion into practice, the operator would be *the greatest sufferer* — 'unless my nose deceives me.' " Dr. Fitch persuaded a neighbor to experiment with slaked lime as a repellent, but heads of grain treated with it, when observed at night under lantern light, had as many flies hovering about them, ready to deposit eggs, as untreated heads.

Preventing the wheat from blossoming when the insect appears seemed more plausible to Dr. Fitch. In other words, sow winter wheat early and spring wheat late to shield the grain from the pest. Evidence seemed inconclusive, but this method worked and led to more successful

wheat culture.¹² Dr. Fitch also suggested destroying the larvae after grain is threshed. The usual habit had been to throw the infested chaff out of the barn, thus unknowingly allowing the pest to live. "Now it is scarcely necessary for me to say, that the screenings of the fanning-mill should invariably be closely examined, and if the minute yellow wheat-worms are numerous in them, the person should consider it a sacred duty which he owes to himself and his neighbors, to consign these screenings at once to the flames."

Dr. Fitch ended his paper with a description of the wheat midge, which he concluded was identical with the European pest. The paper was published with some errors concerning the insect's metamorphosis because he was "under whip and spur" from his editor.¹³ But this timely paper was unusually thorough and well illustrated — a masterpiece for its time.¹⁴ Dr. Fitch had it reprinted in pamphlet form for distribution to scientists and agriculturists.¹⁵ The State Agricultural Society also had it printed in its *Transactions* for 1845 and in pamphlet form.¹⁶ It was widely noticed in foreign and domestic agricultural journals, including the *Gardeners' Chronicle* in England and the *American Agriculturist*, the *American Farmer*, and the *Ohio Cultivator*. Dr. Fitch quickly became known to the agricultural and scientific world for his careful observations and perspicuous style.¹⁷

The period 1846 to 1848 was important for Dr. Fitch's professional development. He produced a lengthy review of the Hessian fly problem for Dr. Emmons' *Journal*, and it, too, was reprinted by the State Agricultural Society, reissued in pamphlet form, and reviewed by the agricultural press.¹⁸ His articles on winter insects of eastern New York and the currant spanworm were widely noticed in America and Europe.¹⁹

In 1846, Dr. Emmons requested Dr. Fitch's help in preparing his volume on the insects of New York for the natural history survey.²⁰ The volume, published in 1855, only contributed to Emmons' already tainted scientific reputation. The plates, which his son had drawn, were criticized for their poor execution and coloring, and the text was severely criticized for its many errors. Emmons' unprofessional treatment of the insects was decried by J. L. LeConte years later as a "striking illustration of waste of money" and a "permanent example of misplaced confidence and liberality; an equal disgrace to the legislation, the science and the art of the great state in which it was published."²¹ Even before he had seen a copy, Dr. Fitch regretted having worked on the volume; he did not want his name associated with it. He explained to Dr. Harris early in 1855:

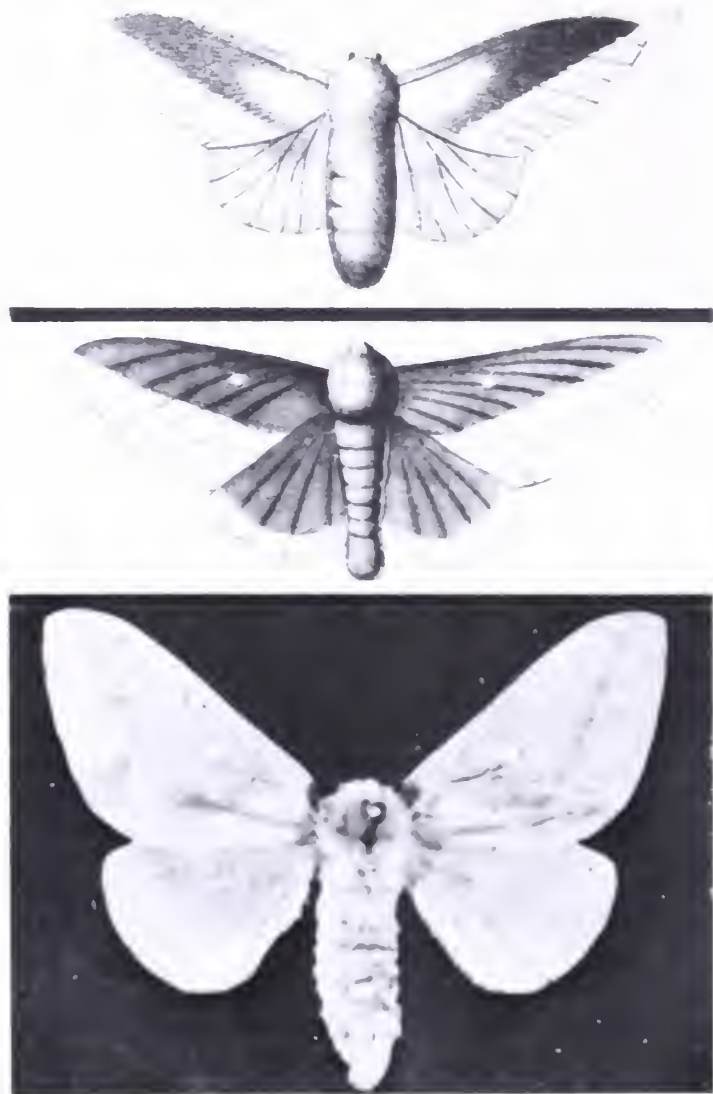
I have not yet obtained Emmons' "big book." Indeed, I dread looking into it, knowing what a hotch-potch thing it must be, and not knowing what use has been made of my name in it. Last September, as I was packing up to start next day on a journey, the Dr. unexpectedly dropped in on me,



Illustration of the currant spanworm, *Itame ribearia* (Fitch), from one of Dr. Fitch's early entomological publications (Engraved and printed by Gavit & Duthie, from Transactions of the New York State Agricultural Society 7:460 [1848]).

with a bundle of the engravings, for me to name the figures therein. The specimens from which the drawings were made he did not think it was necessary to bring, as the figures were "perfectly accurate" showing everything which the specimens showed! On hastily glancing over the plates (for I had not time to examine deliberately) some of the figures I recognized, others I could only guess at, & others still I could form no conception of what they were. He also looked over my cabinet and took down some names from thence, although informed they were of no value, some of the families having been ticketed many years ago, when I had scarcely any authorities at hand to aid me in the work. As mineralogy is the Doctor's specialité, and I have some minerals which I should like to have named, I think it will be but fair for me to ask the Dr. to reciprocate the favor he asked of me, and send him "accurate drawings" of these minerals, that he may name them for me. Like his volume on Fruits, this on Insects, I think, must fall still born from the press.²²

Emmons' report, entitled *Insects of New York*, contains lit-



Illustrations of female pinkstriped oakworm moths, *Anisota virginien-sis* (Drury), from Emmons' *Insects of New York* (top and middle) compared with a photograph of a pinned, museum specimen (bottom) (Top and middle illustrations from pl.36, fig.1, and pl.40, fig.5, respectively).

tle new or original material. The only new species described are 15 or 16 treehoppers (Membracidae), for which Dr. Fitch provided specimens and generic and specific names. In 1846, when Emmons requested his assistance, Dr. Fitch had been collecting and studying Orthoptera, Hemiptera, and Homoptera (including Membracidae). He found the Homoptera in unexpected numbers and decided to work up several new species for Emmons' book.²³

Now that he was so engrossed in entomological work, Dr. Fitch decided to produce, as far as possible, a full manuscript catalog of all known species of insects, a seemingly prodigious task, but it was thought then that only about 30,000 species of insects occurred in the United States, with only about a tenth classified and described.²⁴ Dr. Fitch estimated that there were about 600,000 species world-

wide, with only about a sixth described. "And here I would enquire, if any one will presume to say, that the hand of Omnipotence has exerted itself to populate the earth with such myriads of living, acting creatures for no purpose? Will any one dare to assert that these countless hosts were

'born to live unseen

'And waste their beauties on the desert air?'"²⁵

Harris encouraged Dr. Fitch to work on the Homoptera and lent him books and papers to aid the new project. Overburdened with other cares, Harris was abandoning entomological work.²⁶ Dr. Fitch initiated the work but quickly found more avocations. After the State Legislature revived the policy of aid for the promotion of agriculture in 1841, a new Washington County Agricultural Society had been formed. Following the example of his father's involvement with the earlier county society, Dr. Fitch had become involved with the new society from the beginning. He had actively participated in its organization, served as its secretary, and, in 1848, served as its president.²⁷ The State Agricultural Society, always interested in new ways of improving agriculture, initiated a program of county agricultural surveys in 1847. Dr. Fitch was engaged to survey Washington County. Not only was he involved in his local society, but he had been trained by Amos Eaton, the man who had conducted the first agricultural and geological survey on this side of the Atlantic.

The State Agricultural Society's Executive Committee adopted an extensive plan for the county survey. B. P. Johnson, Corresponding Secretary, indicated that as the first survey attempted by the Society, and it was expected to be a model for the other counties. The 21 points of the plan called for a survey of the state of agriculture in the county and every subject connected with it – from minerals, fossils, soils, and insects, to the history of settlement, crop yields, sustaining industries, and the state of education.²⁸

Dr. Fitch went to work with typical zealotry. In his geological work he was aided by Charles B. Adams, a Middlebury College professor of natural history who had cooperated with Professor Hitchcock and W. W. Mather in the New York and Vermont geological surveys. Professor Adams was Dr. Fitch's closest neighbor with similar tastes for natural history, and they quickly became friends.²⁹ In the historical work, Dr. Fitch found a subject that interested him more deeply than he supposed anything could except natural history.³⁰ To collect historical information, Dr. Fitch took the novel approach of visiting octogenarians

in the county who had lived there in childhood. While gathering information on agricultural history, he found that many of the people he interviewed remembered details of the Revolutionary War, and he deemed it his "paramount duty to carefully rescue from oblivion and preserve to the world, such impressive mementos of those pangs which attend a nation's birth."³¹

Dr. Fitch's survey report was published in two sections in the *Transactions of the New York State Agricultural Society* for the years 1848 and 1849.³² Although not the complete agricultural survey the State Agricultural Society intended, it was more thorough than any yet attempted in any district of the State and, indeed, a model to be followed. The historical portion of the report attracted much general notice and led to Dr. Fitch's election as a corresponding member of the New York Historical Society and an honorary member of the New Jersey Historical Society.³³ He continued to collect historical notes on Washington County for the rest of his life, amassing some 1800 pages.³⁴

Having completed the survey of Washington County, Dr. Fitch returned to entomology and his research on the Homoptera. The Regents wanted an insect collection for the State Cabinet of Natural History. Apprised of the ardor and success with which Dr. Fitch had been pursuing entomology, they requested his aid, and he readily assented to their wishes, presenting about 600 specimens, mostly beetles, from his personal collection. In 1849, he published a catalog of this early, public collection.³⁵ He acknowledged the haste with which it had been assembled, and Samuel Haldeman was suspicious of the identifications.³⁶ The Regents, however, predicted that if Dr. Fitch were sustained in his pursuits, a fine public collection would be formed, affording the "best facilities for studying such as are noxious to vegetation and destructive to fruits." The State paid Dr. Fitch \$80 for the specimens and their curation.³⁷

By 1848, Dr. Fitch decided to revise the taxonomy of the New York representatives of the order Homoptera. He not only borrowed books from Dr. Harris to aid his investigations but also Harris' entire collection of Homoptera.³⁸ In return, Dr. Fitch added specimens from his personal collection to Dr. Harris' collection.³⁹ Early in 1851, Dr. Fitch published a catalog of about 300 specimens of Homoptera that he collected and arranged for the State Cabinet of Natural History.⁴⁰ In it, he described 6 new genera, 85 new species, and 5 new subspecies.⁴¹ Dr. Fitch was paid another \$80 for his services to the State.⁴²

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The State Supports Entomological Research

Only a few years before Dr. Fitch started his work on economic entomology, insects were seldom regarded as serious pests, although they were seen as obnoxious and sometimes dangerous. Man's agricultural practices recently (geologically speaking) had changed ancient, stable relationships between plants and insects, unwittingly producing pestilence. He arrived only after the plants and herbivorous insects had lived in equilibrium, with neither becoming threatened or multiplying excessively for some 200 million years. It is unlikely that man had much evolutionary influence on plant-insect relationships at the time of his appearance, but after he invented agriculture, about 10,000 years ago, he began to significantly alter these relationships to his own detriment.¹

The evolutionary relationships between plants and insects were probably little influenced by the sparse populations of Indians in the northeastern United States, and even the advent of Europeans probably did not alter the relationships much. The crops of the early American colonists, which occupied a relatively small acreage, apparently did not suffer serious insect attacks. Few insect pests had been introduced from other countries, and apparently few native insects attacked the cultivated plants. The infrequent attempts at insect control were unorganized. In puritanical New England, insect infestations were believed to result from the sins of people. As late as the mid-eighteenth century, fasts were held to beg deliverance from the scourges of caterpillars.² In fact, prior to the nineteenth century, poor weather, soil exhaustion, and restrictive socio-economic conditions were the greatest deterrents to successful harvests; insect problems remained in the background.

As human population and the acreage and variety of crops increased, more and more demands were made on the environment. A new ecology was created in North America in only about two centuries. Plants and insects

were thrust into this new world and forced to pursue their co-evolution. The ancient stabilized relationships were altered in an incredibly short time; the environment of native plants has been dislocated, and the ecology, physiology, genetics, and culture of domesticated plants have been so manipulated that they are incapable of reproducing without man's assistance. They no longer co-evolve with their environment and pests. These "modern" plants are more susceptible to pests and diseases.

Late in the the eighteenth century, farmers became concerned about insect damage to their crops. The idea of insects as pests was born, and the number of injurious insects seemed to increase with time. This advancement of insect pests reflects advances in colonization, agriculture, transportation, and commerce, and the continuing inter-



"American Farm scenes — Summer." American agriculture expanded rapidly in the nineteenth century. The expansion was accompanied by an unprecedented increase in the ravages of pest insects (Original sketch by F.O.C. Darley, from American Agriculturist 20:208 [1861]).

ference with ancient plant-insect relationships. These practices set the stage for native insects, like the migratory grasshopper, armyworm, chinch bug, Colorado potato beetle, grape phylloxera, plum curculio, corn earworm, and others to multiply on an abundance of food and to follow the crops into new frontiers. The stage was set for the introduction of insects like the cotton boll weevil, Mexican bean weevil, codling moth, European corn borer, Hessian fly, Japanese beetle, alfalfa weevil, and many others to thrive in a new world. As the Agricultural Revolution progressed, old problems like bad weather, soil exhaustion, and restrictive socio-economic conditions receded into the background, and insect damage attracted increasing attention.³

America came to be viewed as “the land of insects,” and Dr. Fitch pondered the alarming problem.

And that America is the land of insects — that we are here sustaining greater losses from this class of objects than are experienced in corresponding parts of the old world — and that we shall be obliged to study their habits in order to successfully combat them and prevent their ravages, before our soil can possibly sustain so dense a population as exists *there*, scarcely admits of a doubt.⁴

Dr. Fitch had constant occasion to examine reports on the injurious insects of Europe. He concluded that the losses sustained in America immeasurably surpassed those in Europe. Insects regarded as serious evils there were deemed scarcely worthy of notice in this country because the damage they caused was so trivial. There, if an insect pest reduced the wheat crop by 10 percent, communities became alarmed, but here so slight a loss passed unnoticed. The same insects that appeared harmless or only occasionally attracted attention as pests in Europe appeared to become “armed with the club of Hercules” upon crossing the Atlantic. They seemed to advance over America like an invading army, devastating the vegetation in their path. They continued their depredations season after season, and not for many years did their destructiveness subside.

Noxious insects presented a philosophical problem for those who drew arguments from natural theology to explain how natural phenomena were designed to benefit man. Echoing Linnaeus, Dr. Fitch styled insects “the diligent and faithful servants of nature — perpetually engaged in destroying all that is dead, and checking the increase of all that is living in the vegetable world.”⁵ Man, he said, destroys the natural balance by making one plant occupy the land to the exclusion of all those others that nature decreed should diversify the same spot. “Nature, as it were, resents this violence done to her arrangements, and seeks to restore the equilibrium and preserve the harmony which her laws require.” Dr. Harris observed that destructive insects are limited by the elements and natural enemies, including other insects, but “too often, by an unwise interference with the plan of Providence, we defeat the very

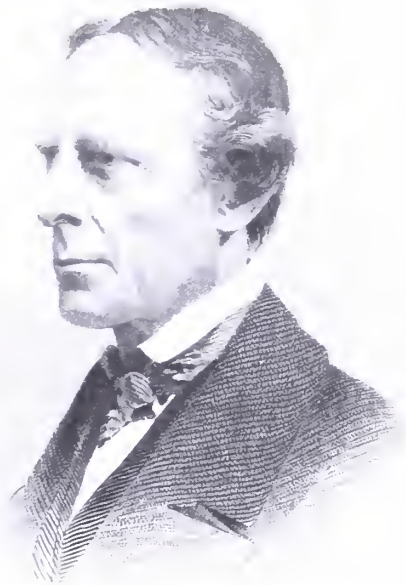


“American Farm Scenes — Autumn.” Victorian naturalists understood that man destroys the natural balance by making one plant occupy the land to the exclusion of all those others that Nature decreed should diversify the same spot (Original sketch by F.O.C. Darley, from *American Agriculturist* 20:336 [1861]).

measures contrived for our protection.”⁶ Victorians commonly refused to believe that Divine Providence had placed any insect enemy in this world without also endowing man with sufficient intelligence to discover a means by which to overpower it. “But all interference with the laws of the Creator is limited. Man is not allowed to extirpate, though he is permitted to reduce and restrain these pests within narrowed limits.”⁷

By the early 1850’s, New York State’s citizens and legislators were painfully aware of the desirability of studying the insect fauna. Agriculture was the cornerstone of the American economy — a fact reflected in society and politics. It controlled a larger amount of capital and a larger work force than any other industry and largely determined the direction of government policies.⁸ American agriculture expanded westward with the growth of transportation facilities. By the 1840’s, western farmers were competing successfully with New York and New England farmers for urban markets created by the Industrial Revolution and the expansion of specialized agriculture in the South. With the economy in a state of flux, New York and New England farmers worried about their worn-out soil and the diseases and insects that plagued their crops.⁹

As insect damage increased at an alarming rate, Americans realized something had to be done. The Massachusetts Legislature had made provision as early as 1831 for the preparation of a list of insects native to the state, as part of its natural history survey. Dr. T. W. Harris published a list of 2350 species in 1833.¹⁰ For his labor, he was presented with several copies of the list and a copy of the natural history report to which it was appended.¹¹ In 1837, the Legislature appropriated funds for a more thorough survey, and Dr. Harris again was commissioned to report on entomology, especially its agricultural and economic aspects.¹² In



Thaddeus William Harris (From S.H. Scudder (ed.), *Entomological Correspondence of Thaddeus William Harris*, Occasional Papers of the Boston Society of Natural History 1 [1869]).

1838, he presented a partial report, treating only the beetles.¹³ An expanded report, intended for the use of farmers, was published in 1841.¹⁴ This report was immensely successful. Indeed, it was the first practical, yet scientific, work on our native insects. In 1846, John Curtis, a renowned English entomologist, called it "the best book of the kind ever published."¹⁵ The report was republished in 1842, again in revised form in 1852, and posthumously, with illustrations, at least six different times in 1862.¹⁶ Dr. Harris' reputation today rests mainly upon the illustrated third edition, which was widely used until nearly the turn of the century, but which he never saw. He was paid \$175 by the State of Massachusetts, which did not even cover the cost of the books he had to purchase to provide his services.¹⁷

Although American economic entomology had progressed by the 1840's, the insect fauna was insufficiently studied. Dr. Harris' work dealt mainly with New England insects. Elsewhere in America, insect pests were poorly known. In fact, progress in entomology lagged behind that in other branches of natural history in America and Europe. Victorians avidly studied plants, birds, shells, and other attractive natural objects as a popular, rational pastime. Like Dr. Fitch, they also studied the natural productions of the earth to approach a closer knowledge of God and to observe His beauty and perfection in nature. Entomology was neglected for several reasons. Insects were



"An Impressive Lesson in Natural History." During the Victorian Era, natural history was a popular pastime (Original painting by Helmsly, from *American Agriculturist* 20:88 [1861]).

popularly considered ugly, filthy, noxious, and otherwise insignificant creatures. Their small size, large number, and supposed poisonous qualities made them difficult for the amateur to study.¹⁸

Early progress in the study of American entomology took the form of description and classification of new species. Much of the earliest work was accomplished in Europe by Linnaeus and his followers in the latter half of the eighteenth century and early nineteenth century. Thomas Say, the first to make a determined effort to create an American literature on American insects, described more than 1500 species. His three-volume *American Entomology*, published from 1824 to 1828, was the first great work in America by an American entomologist; it was one of the first American scientific publications to win respect in Europe.¹⁹ Even so, the rush to systematize and describe insects was well underway in Europe by the late eighteenth century, and such work lagged miserably in America for at least another 50 years. In France, Germany, Great Britain, and elsewhere on the continent, naturalists had pursued every

branch of natural history with such enthusiasm that it seemed every plant and almost every insect had been discovered and described by the mid-nineteenth century.²⁰

Dr. Fitch complained bitterly about the entomological ignorance of American natural historians and farmers and about the unavailability of the European literature on American insects. In 1853, he vented his views in the *Journal of the New York State Agricultural Society*.

. . .Mauger all our vaunted light and intelligence, in this, one of the most important branches of natural science to the farmer, and one of the most interesting departments of nature's works to every studious and enquiring mind, our country at the present day is sunk in Egyptian darkness. In diffusive information, so far as respects Entomology, we are lagging far behind the subjects of several of the monarchical and despotic governments of the old world. In Germany and Prussia, countries which are regarded as much less enlightened than our own, not merely is a Professor of this science deemed indispensable in every University, and every Agricultural Seminary, but its rudiments are taught in all their primary schools. In this country, on the other hand, such a thing as a course of lectures upon this science, has never yet been delivered, except perhaps in one or two of our Universities. Indeed much of the very foundation of this science, upon this side of the Atlantic, is yet to be laid. Whole groups and families of our insects have never yet been examined. We have not even names by which to designate a considerable portion of our species. . . . In no other department of science is an exploration so urgently required, so loudly called for, as in this. Scarcely a week passes but that one or another within the circle of my acquaintance is coming to me with some insect which he has detected, preying upon some article of property; of which insect he is anxious to know the name, habits and remedies. . . . It is indeed surprising that this branch of natural science, in an economical aspect second to no other in its importance, should have remained to this day so lamentably neglected.²¹

The general unavailability of the European entomological literature undoubtedly accounts for much of the delay in American entomology. Many American insects were described in the European literature, but few of these works reached our shores in the first half of the nineteenth century. Dr. Fitch felt that a student could gather all the entomological works available in the State of New York and still not have a third of what he needed to name the insects of the State accurately. Furthermore, American museums did not provide the vast collections of identified insects that were available to European students. "And I have often thought for one to obtain accurate & full acquaintance with

our insects, the only way is, to collect our specimens fully, and repair with them to Europe, where every facility is presented for ascertaining their names, — none of which facilities are here furnished."²²

As early as 1850, Dr. Fitch indicated to T. W. Harris that there were rumblings about a legislative appropriation for an entomological survey of New York State and that Dr. Emmons' volume on the State's insects would not present enough original research to interfere with a possible new appropriation.²³ In 1853, Dr. Fitch publicly stated, "In that valuable series of volumes, the Natural History of the State of New York, we are presented with a full description of every object in the animal, vegetable and mineral kingdoms, that exists within our borders — save only our insects. This most important hiatus remains to be filled, to complete that great work and render it full and entire as it was designed to be. Each succeeding year is showing how urgently we need the information which this part of that work would furnish us. Why should its completion be longer delayed?"²⁴ He stated this knowing that Emmons' work on insects would soon be published, but also that it would be of little practical value. It is tempting to speculate that he was lobbying for the new appropriation so that he himself could procure the position of survey entomologist.

In the meantime, Dr. Fitch had been asked if he would be willing to take charge of entomology at the floundering Albany University — all of the arrangements until now having been temporary and experimental. He replied, conditionally, in the affirmative, but Dr. Henry Goadby, formerly of the Royal College of Surgeons in London, was employed to give a partial course on entomology with special reference to agriculture.²⁵ He was an elegant lecturer, but apparently not as popular as he could have been with his class of about 60 students.²⁶ Dr. Fitch visited Albany to learn about progress with the university project and to meet Dr. Goadby. He was disappointed to find the University in a state of uncertainty, with no prospect of sustained funding, and that Dr. Goadby had no knowledge of systematic entomology, naming his specimens only from hearsay. Also, his lectures did not touch upon agricultural entomology — only the anatomy of insects.²⁷

In a more determined effort to obtain funding for a professional position in entomology, Dr. Fitch considered running for a seat in the State Legislature in the fall of 1852 so he could encourage passage of an act providing for the completion of the natural history survey. If he could not, he planned to work for the establishment of an agricultural college where he might obtain the position of Professor of Entomology. He felt compelled to obtain without further delay a means of financial support that would enable him to devote his attention to entomology.²⁸

Dr. Fitch did not attain these goals, but the following autumn, Ebenezer McMurray was elected assemblyman from the first district of Washington County. Like Dr. Fitch, McMurray was an educated Salem farmer, and they had attended the Washington Academy together as youths.

They also were members of the Presbyterian Church and affiliated with the Whig Party. Indeed, Dr. Fitch had been elected an honorary member of the American Whig Society of Princeton, New Jersey, in 1847.²⁹ On February 25, 1854, Mr. McMurray notified the State Assembly that he would soon introduce a bill providing for the classification and enumeration of the insects, and for the appointment of a commissioner for this purpose.³⁰ That same day he wrote Dr. Fitch for advice. Dr. Fitch naturally suggested that the bill provide for selection of some competent and suitable person by the Regents, to be commissioned by the Governor to prepare a volume on the insects of the State corresponding with the other volumes of the "Natural History of New York." Again, he did this without admitting to the work being performed by Dr. Emmons. He also suggested that the person assigned to do the work be required to arrange for the State Cabinet of Natural History a suite of specimens described in the contemplated volume.³¹

Legislators were aware that the State natural history series was not complete as originally designed, that insects were causing great damage each year and that European governments had liberally supported entomological investigations. On April 17, 1854, the last day of the session, the State Legislature passed a general appropriation bill that provided \$1000 for an investigation and description of the insects of the State, particularly those injurious to vegetation.³² Furthermore, the responsibility for the investigation was not turned over to the natural history survey. It had been objected that the volumes on natural history, so purely scientific in character that they were unintelligible to most citizens, had little practical value. The new appropriation might also have been directed away from the survey in order to obviate further problems with Emmons' services to the State. The new entomological investigations were placed in charge of the State Agricultural Society to ensure that they would have direct reference to economy, as well as scientific accuracy.³³

On May 4, the Executive Committee of the State Agricultural Society met in New York City and resolved to appoint Dr. Asa Fitch as Society Entomologist. The Committee gave him detailed instructions and a reminder that equal prominence should be given to economic and scientific entomology. He was to concentrate on pests of fruit trees during the first season of the appointment but also was not to neglect opportunities for studying other pests because such opportunities might not appear again for many years. He was instructed to study life histories and look at all life stages; to collect, name and describe as many insects of the State as possible; and to deposit specimens in the State Cabinet of Natural History and examples of the damage they cause in the museum of the State Agricultural Society. These instructions were so comprehensive that it seems likely Dr. Fitch himself played a role in formulating them.³⁴

After receiving the appointment, Dr. Fitch went to work zealously. He dropped the town offices and other minor positions that had occupied part of his time and withdrew

from nearly every other diversion to concentrate on entomology. At first he felt obliged to travel to various parts of the State, but he soon realized that there were more insects at his own doorstep than he could investigate and became reluctant to waste time travelling. He worked primarily at Fitch's Point, spending countless hours in the "bug house." For a week at a time, he would catch his sleep in an armchair, waking at intervals to note transformations in the insects before him. His meals and an extra hour after tea to read the newspaper were all the leisure he allowed himself, and even then a pocket-net was always within reach to capture insects that ventured near him.³⁵

Following the State Agricultural Society's instructions, Dr. Fitch concentrated on pests of fruit trees during the 1854 season, leaving insects of grain crops, gardens, and other situations for later years. Although a fledgling field, horticulture was a rapidly growing and important industry



Horticulture was a rapidly growing industry in New York during the nineteenth century (From American Agriculturist 21:336 [1862]).

in New York. Commercial fruit growing got underway in the 1830's and 1840's when fruit could be shipped by steam-powered transportation on land and water. However, it was not until agricultural colleges and experiment stations were established late in the nineteenth century that orchard management would receive much attention. Agricultural authors generally asserted that tillage, fertilizers, and even pruning caused trees to overbear. Attempts to control insect pests and fungus diseases were few and almost completely futile. Caterpillars, aphids, weevils, and other insects committed their plunderage unchecked by human intervention. It remained for Dr. Fitch and those who followed to study the life histories of injurious insects, describe them, and teach farmers practical entomology.³⁶

By late June, 1854, Dr. Fitch had found more than a dozen different species of undescribed "worms" feeding on apple foliage, and new ones were appearing every few days. He attempted to rear them to the adult stage and preserved the insects and examples of the damage they

caused. This was time-consuming work, and he complained, “. . . the worms I have gathered require to be fed and nursed with even more regularity and care than a flock of Saxony sheep in winter.”³⁷ Nevertheless, Dr. Fitch persisted with his work and presented to the State Agricultural Society his first report on the noxious, beneficial, and other insects of the State of New York, bearing the date March 14, 1855. The report received high commendation from the Society, which submitted it to the State Legislature. A select committee concluded that this able and interesting account would induce orchardists to be on the alert and save their trees from insect pests, and that the benefits of continuing the entomological investigations far outweighed the costs to the State:

. . . Indeed, the State is *too poor* to do without the contribution which can thus be made to her resources, and science will never excuse the Legislature, if it shall refuse the appropriation for this work. It has been a topic of remark and congratulation in scientific circles of Europe, which appreci-

ate its importance, that the additions which will be made to the science by the exploration of the insects of this State, will be of great value to the student of “American Entomology.”³⁸

The continuance of the appropriation for carrying on the entomological work was granted by the Legislature, and Dr. Fitch’s first official report was published in 1855 in the *Transactions of the New York State Agricultural Society* for 1854.³⁹ It was well received by the public. Even before it was published, Dr. Fitch was elected to membership in the Entomological Society of France, perhaps the first time this honor was conferred upon an American.⁴⁰ Altogether, legislative appropriations would be made for Dr. Fitch’s continuance as Society Entomologist for 19 years, through September, 1872. A meager \$1000 was appropriated for his salary each year except 1868, when a 25 percent increase was approved, only to be dropped the next year. Dr. Fitch produced a series of 14 official reports that were published in the Society’s *Transactions* for each year of his appointment except 1859, 1865, 1868, 1871, and 1872.

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- ³⁴W. Kelly and B. P. Johnson, Entomological survey, *Trans. N. Y. State Agric. Soc.* 14(1855): 700-703.

³⁵C. Johnson, *History of Washington Co., New York* (Philadelphia: Everts & Ensign, 1878), p. 187.

³⁶Hedrick, *History*, pp. 380-404.

³⁷A. Fitch, Entomological survey, *J. N. Y. Agric. Soc.* 5(1854): 36-37.

³⁸New York State Assembly Document 137, 1855.

³⁹A. Fitch, Report, *Trans. N. Y. State Agric. Soc.* 14(1855): 705-880.

⁴⁰Anon., Continuation of the entomological survey by Dr. Fitch, *J. N. Y. State Agric. Soc.* 6(1855): 4; Anon., [untitled], *Cultivator* 3(1855): 160.



Dr. Fitch's Contributions to Economic Entomology

The Fitch entomological reports, the first series of the kind published in the United States, became models for later entomologists, including Walsh, Riley, Packard, Thomas, and Lintner. In fact, Dr. Fitch essentially established the model for professional entomologists in government service.¹ His reports, based largely on the results of original observations, were arranged to be useful to both scientists and farmers. Instead of treating insects in a scientific, systematic order, Dr. Fitch arranged them by the crops they destroy. For example, in the first report, he treated mostly fruit tree pests. Beginning with the apple, he treated in succession insects affecting the roots, trunk, twigs, leaves, flowers, and fruit. In the same order, he treated insects that occur on pear, peach, plum, and cherry trees. Dr. Fitch endeavored throughout to couch his reports in plain, familiar language, avoiding unnecessary technical terms. His concern with science for the common purposes of life, which he absorbed from Professor Eaton, is plainly evident.

The domestic and foreign press, including newspapers and agricultural and scientific journals, frequently reviewed and excerpted the Fitch reports. Rarely did they give less than the highest praise. The editor of the *German-town [PA] Telegraph* described the second report as “a searching, intelligent and valuable work” and complimented the layout, illustrations, and simplicity of composition.² In 1858, the State Agricultural Society reported having received convincing evidence of the value of Dr. Fitch’s work from every corner of the State, as well as from other states and foreign countries. Constant requests were made for the reports as soon as they were issued. Some of the leading farmers of New York State advised the Society of the great advantages they realized by paying careful attention to Dr. Fitch’s recommendations and suggestions.³

The State Legislature periodically had most of Fitch’s reports reprinted. For example, in April, 1856, the Assembly

and Senate concurred on a resolution to print and bind together the first and second reports. A total of 500 copies were ordered for the author, 1000 for the State Agricultural



Illustration of the maple leafcutter, Parademnesia acerifoliella (Fitch), and the damage it causes from Dr. Fitch's second report on the noxious, beneficial and other insects of the State of New York (From Transactions of the New York State Agricultural Society 15:pl.4 [1856]).

Society, and 24 for each member, officer, and reporter of the legislature.⁴ In London, Professor John Lindley, a distinguished botanist and horticulturist – and principal editor of the *Gardeners' Chronicle* – praised the volume. He considered the style and layout to be the best way of ren-

dering entomological information useful to the mass of mankind and regretted that the observations of Curtis and Westwood in England were not collected and arranged similarly. He regarded Dr. Fitch as an observer of a high order and complimented his consistency in applying basic natural history to the common, practical purposes of life.⁵

In Paris, in 1858, the Section of Natural History of the Imperial and Central Society of Agriculture proposed that the Society award Dr. Fitch a gold medal with a bust of Olivier de Serres, Father of French Agriculture, on one side and Dr. Fitch's name on the other. The Society concurred, and the medal was awarded in acknowledgment of the Society's duty "to encourage all good works undertaken in such a useful direction."⁶

Dr. Fitch's work continued to attract attention, and the State Agricultural Society was justly proud. In 1861, the Society reported that every year the entomological work was appreciated more and more. Requests for Dr. Fitch's sixth report came from every section of country and most of the entomological associations of Europe. The Society was gratified to learn that the reports were instrumental in turning the attention of many citizens of the State and the country to entomology.⁷

Indeed, the Fitch reports also turned the attention of Europeans to the scientific study of insect pests. Although for decades Europeans had an edge in describing and classifying insects, Americans were now gaining an edge in economic entomology. In 1857, in the introduction to his *Farm Insects*, John Curtis, an English entomologist, complained of the backwardness of his own people in pursuing applied entomology. He pointed out the good work done by Harris and Fitch in America, Guérin Méneville and Bazin in France, Passerini in Italy, and the entomological savants of Germany.⁸ In 1865, also in England, the *Mark Lane Express* reported that in the United States much more attention was given to practical entomological studies and complained that it had been some time since anything was done in this direction by the Royal Agricultural Society of England.⁹

A multitude of similar commendatory notices could be mentioned, but it is apparent that, working in scientific isolation at his rural abode, Dr. Fitch had become pre-eminent among the world's pioneer entomologists. His research and reports were so highly regarded abroad that, in addition to the Entomological Society of France, he was elected to membership in the Entomological Societies of Philadelphia, Germany, and Russia, and other scientific societies at home and abroad. He felt that he had little time for other than the most important correspondence, but among his correspondents were such eminent entomologists as Harris, Herrick, Osten Sacken, Curtis, Westwood, Gerstaecker, and Riley.¹⁰

The enduring value of the Fitch reports is evident from the fact that they were in demand decades after they were written. In 1880, C. V. Riley stated that they should be republished because of their scarcity and importance.¹¹ As

late as 1891, F. W. Cording considered Fitch's 14 reports among the first to be placed in an entomologist's library and prized possessions of intelligent farmers. He called them a grander monument to Dr. Fitch than any that could have been constructed from marble or brass.¹²

As late as 1936, H. B. Weiss wrote of the Fitch reports, "They are indispensable to American entomologists and are frequently utilized at present. Much of their information has been reprinted over and over by later authors until the original source has been lost sight of."¹³ This habit of taking Dr. Fitch's word unquestioned, however, has sometimes led to the preservation of inaccuracies. In his third report, Dr. Fitch gave his opinion that bot flies castrate their squirrel hosts. This remained established dogma for over 120 years, until in 1981 it was questioned and demonstrated to be unsupported by evidence.¹⁴

During his professional career as New York's official entomologist, Dr. Fitch served as entomological correspondent for some of the popular farm papers. He wrote a series of more than 30 articles for Luther Tucker's immensely successful papers, the *Country Gentleman* and the *Cultivator*. Through these columns, he obtained wide popular exposure and brought entomology to the attention of the "dirt farmer" and the scientific agriculturist. This exposure served his own aim to collect information on noxious insects from farmers around the country.¹⁵

Dr. Fitch also published occasional entomological articles in other farm papers, such as the *American Farmer*, *Ohio Cultivator*, *Genesee Farmer*, *Boston Cultivator*, *American Agriculturist*, and *Prairie Farmer*, and in local newspapers. His original entomological publications, including the official reports, number more than 140. Counting the reprints, revisions, extracts, and compilations of original articles, the publications number over 220, thus giving some indication of their popularity and demand. Dr. Fitch apparently never published articles in the scientific or entomological journals of his day, such as the *American Journal of Science* or the *Practical Entomologist*, and he made no apology for describing and naming new species in the popular press, probably because the need for names for our American insect species was so great at that time.

Although much of Dr. Fitch's work on economic entomology has been superseded, it has had a lasting value as a stimulus and model for subsequent workers, and it aroused the attention of citizens and governments to the importance of entomology. Dr. Fitch publicized the science, stressing its importance for the common purposes of life. His use of simple language in scientific writing was followed by Walsh, Riley, Lintner, and others. The *Practical Entomologist*, a short-lived bulletin founded by the Entomological Society of Philadelphia in 1865, endeavored to reach the practical farmer, and its editors avoided all technical terms as nearly as possible.

The fact that Dr. Fitch's work served as a model appears frequently in the literature. Lintner claimed that Fitch's reports led the way for similar investigations in other states;

he recognized that the interest they aroused influenced the valuable works of Riley in Missouri and Walsh and LeBaron in Illinois.¹⁶ After reviewing the universal good that emanated from Fitch's work, Walsh called for Illinois to furnish a "Bugmaster-general" to fight a large and destructive army – the Noxious Insects of the United States.¹⁷ He publicized the dangers of insect pests so well that the Illinois State Legislature created the office of State Entomologist at its 1866-1867 session, and he was appointed to it. As the years passed, the influence of Dr. Fitch's appointment was felt widely. In 1891, F. W. Goding summed up the situation:

The importance of the study of entomology, in its relations to agriculture and horticulture, has been fully recognized by most of the governments in the civilized world, and nearly all of them have employed agents or commissioners to investigate the depredations of various noxious insects, with a view to discover a means of averting or remedying the great damage done by them. The State of New York early appreciated the need of such line of investigation, and in 1854 made an appropriation for that purpose. Dr. Fitch's appointment followed, and his seventeen years of unremitting toil evinced the wisdom of the move.¹⁸

Dr. Lintner also remembered to credit the State Agricultural Society:

The labors of Dr. Fitch will long be held in grateful remembrance, and the New York State Agricultural Society may justly lay claim to having, by its action in connection therewith, done very much toward the promotion of Entomological research, not only within the immediate sphere of its labors, but throughout the Union, and to science at large – coextensive with the civilized world.¹⁹

In Washington, D. C., Dr. Fitch's appointment received national recognition at the 1954 centennial celebration of the establishment of entomological research as an essential government function.²⁰

Perhaps an indirect result of Dr. Fitch's labors was the establishment of a teaching center for entomology. Dr. Fitch rarely lectured to students, although he occasionally spoke to farmers at the State Agricultural Society's annual fairs and meetings, and in 1860 he gave a course of six lectures on economic entomology at Yale University.²¹ However, it was a fortunate circumstance that his work fell under the eyes of Ezra Cornell of Ithaca.

In 1862, Cornell was president of the State Agricultural Society and a trustee of the State Agricultural College in Ovid. The Society had fought for the establishment of the college, but it was languishing from lack of funds. The Morrill Land Grant Act, which Congress had just passed, appropriated public lands in "aid of instruction in agriculture and the mechanic arts." Andrew Dickson White, a

member of the New York State Senate, had in mind a great American university. Like the one that James Hall had envisioned for Albany over a decade earlier, it would be more comprehensive in plan than any yet attempted, and science and technology would take their proper stand alongside philosophical, professional, and literary studies. White persuaded his fellow senator Ezra Cornell to grant funds in addition to the money realized from the sale of Morrill Act lands for the establishment of such a university. At Cornell's suggestion, the State Legislature transferred the State Agricultural College to Ithaca, and Cornell donated his farm and a half million dollars to the cause. The faculty of the new university was organized in 1867 by the appointment of A. D. White as the first president.²²

As a young man, John Henry Comstock purchased a superbly illustrated copy of T. W. Harris' *Insects Injurious to Vegetation* and quickly became enraptured with entomology. Cornell University soon opened, and Comstock was drawn to it by the announcement that a professorship in entomology would soon be filled. He entered the university in the autumn of 1870. No professor of entomology had been named by 1872, so several students who were aware of Comstock's recently acquired knowledge of the subject asked that the university permit him to present a course of 10 or 12 lectures on economic entomology. The trustees consented. These informal lectures led to his appointment as instructor of entomology in 1873. In Comstock's junior year, a tiny laboratory was established for him in the University's bell tower.²³

Comstock was eager to learn how to do his work. Up to the time he was made instructor of entomology, he had not had any assistance in entomology, so he made a pilgrimage to Salem to visit Dr. Fitch. Years later he recalled that trip as one of the bright experiences of his career. He found Dr. Fitch a genial old gentleman and recalled the remarkable entomological library in his office. When he talked with Dr. Fitch about methods and how to go to work, the doctor replied, "The way to do is to sit down and study an insect." It always remained a blessed memory to Comstock to have seen "that grand old man."²⁴

Comstock graduated in 1874 and was appointed assistant professor of entomology in 1876. He was one of the first teachers of economic entomology in the United States, and through his long career at Cornell, he strongly influenced the development of American entomology. He was a dedicated teacher and wrote several books on insects and spiders. It has been claimed that he taught more than 5000 students. Certainly, generations of students have been nurtured on his books.²⁵

In his publications, Dr. Fitch treated numerous injurious insect pests of New York State in detail. He studied life histories, described and named new species, searched for practical and effective control strategies, and taught farmers practical entomology. Most of his control methods have been superseded, and although much of his lasting reputation as a scientist rests on his careful life history

studies, it is interesting to briefly review some of them and the cultural milieu in which they were developed. Modern insect control methods evolved partly from them, and some of the methods he employed were harbingers of future directions.

With the rapid development of the agricultural press early in the nineteenth century, farmers and gardeners found ample opportunity to address editors with requests for, or offers of, advice concerning agricultural problems. Home cures for the ever-increasing depredations of insects regularly debuted in the farm papers. By the mid 1860's it was estimated that at least 10,000 remedies had been published in the agricultural papers.²⁶ These dusty papers remain a record of the concerns of the farmers of the nineteenth century, and from them it is possible to glean an idea of the insects that were important and the remedies that were commonly applied against them.

Grain and fruit pests received more attention than others. Frequently some noxious material was used to kill the offending insects or to protect the plants — charcoal, soot, ashes, road dust, slaked lime, cow dung, urine, white-wash, scotch snuff, camphor, tar, turpentine, soap, pepper, elder leaves, walnut leaves, quassia, hellebore, and others. Except for sulfur, and later arsenic, the first effective insecticides were plant products, including nicotine, hellebore, and pyrethrum. The materials were used individually or in mixtures, concocted or decocted, and they were dusted, spread, painted, syringed, burned, or inserted into, onto, or near the afflicted vegetation.

The authors of the remedies often supported their claims enthusiastically, explaining in their letters to the editors how efficacious the remedies had been in a single trial, and frequently ending their entreaties with "Try it!" or "Worth trying!" Some even tried to market their nostrums. It is not surprising that the disgruntled farmer, having tried a few of these sure cures and having found them worthless consigned entomological devotees "to a place which it would shock polite ears to mention more explicitly."²⁷ Of course, entomologists recognized the faults of human testimony, the insufficient regard for multiple observations, and the tendency to apply a remedy when the insect damage was most obvious and the satiated culprit had finished feeding. Dr. Fitch and others were diligent in trying to eradicate the entomological charlatans, appropriately named "*Humbuggus entomologicus*."²⁸

Entomologists of the era felt confident that successful insect control depended on a knowledge of natural history. When Dr. Harris revised his classic report in 1852, he wrote, "A familiar acquaintance with our insect enemies and friends, in all their forms and disguises, will afford us much help in the discovery and proper application of the remedies for the depredations. . . ."²⁹ The early entomologists realized there was no panacea — that patient investigation and experiments were needed to combat the onslaught of insect enemies and to discredit the charlatans and humbugs.

Explaining his philosophy of insect control at the 1859 annual meeting of the State Agricultural Society, Dr. Fitch said he could not believe Divine Providence had placed any insect pest in our world without endowing man with sufficient intelligence to discover a method for frustrating or overpowering it. He firmly believed there is no injurious insect that cannot be overcome if we are sufficiently acquainted with its natural history. We must be able to detect an assailable point and devise some measure to destroy the insect or shield the vegetation from its attacks. "We shall discover that, although he may be invulnerable in every other part, no aegis protects his heel, and if we strike Achilles there, we inflict a death-wound."³⁰ This emphasis on bionomics led to many useful and novel insect control strategies, some of which are familiar today: adjustment of planting times, manuring, selection of hardy varieties, manipulation of predators and parasites, baiting, and many more.

The continued ravages of the wheat midge in this country during the early nineteenth century severely affected wheat culture. Numerous economic accounts of the midge appeared; one of the most detailed and exact was the nearly 90-page discussion in Dr. Fitch's sixth report.³¹ New York State was prominent as the scene of the depredations of this insect. Statistics returned to the State Agricultural Society in 1854 showed that New York that year lost \$15 million due to the midge. The pest caused many to abandon wheat culture.³²

When he published his first paper on the "wheat fly" in 1845, Dr. Fitch believed the midge to be an old world species, *Contarinia tritici* (Kirby), known in Great Britain for more than a century as an occasionally serious pest. In the mid-nineteenth century it was detected in northern France. When his 1845 publication reached Europe, the eminent French entomologist C. B. Amyot dissented from the opinion that the wheat midges of the two continents were the same. Dr. Fitch sent specimens to Amyot, who compared them with European specimens, found them identical in every minute detail that the microscope revealed, and concluded that they were, indeed, the same species.³³

Today it is still not certain which species Dr. Fitch considered the wheat midge. In 1912, Ephriam Porter Felt, the distinguished State Entomologist of New York and a specialist on the classification of gall midges, studied specimens labelled "wheat midge" by Dr. Fitch. He concluded that they belonged to an American species new to science, which he named *Prodiplosis fitchii* in honor of Dr. Fitch. The European species, *Sitodiplosis mosellana* (Géhin), recently had been reared from New York wheat-chaff, and this is the species now regarded as the wheat midge. Dr. Felt, however, pointed out that available evidence was insufficient to determine which of the species had been referred to so frequently in earlier economic literature. It could even have been a third species that he described and named *Itonida tritici*, or it could have been all three species or some

other form – but certainly not the European *Contarinia tritici*. This species was characterized as having an especially long ovipositor, which was not present in any of the American wheat midges. Dr. Fitch might or might not have been correct in assuming he was working with an introduced European species.³⁴

That Dr. Fitch considered the wheat midge a European immigrant led him to suggest one of his most innovative and remarkable proposals for insect control. He long knew from foreign accounts that the midge was much more destructive to crops in America than in Europe. After the disastrous harvest of 1854, he weighed the facts bearing upon the situation. In his 1845 paper he had stated that population crashes of the pest, which followed soon after a season in which it had been extremely annoying, were caused by “that beautiful provision of nature . . . that an undue increase in any of the species of the animal or vegetable world never takes place, without being speedily succeeded by a corresponding increase of the natural enemies and destroyers of that species, whereby it again becomes reduced to its appropriate bounds.”³⁵ In Europe there were effective parasites of the midge, and following a year of heavy infestation the fields would abound with parasites, and the midges would be scarce.

But in this country no such parasitic destroyer appears to quell it, and I have hence supposed that we have received this insect from Europe, whilst its parasitic destroyer has not yet reached our shores. Thus we are hence without nature’s appointed means for preventing the undue multiplication of this insect. We have received the evil without the remedy; and hence it is that this little creature revels and riots in this country without let or hindrance.³⁶

Dr. Fitch concluded that it was his duty as Entomologist of the State Agricultural Society to obtain live specimens of the European parasites. He had already corresponded with John Curtis, president of the Entomological Society of London, so he wrote to him about this subject in May of 1855. When Mr. Curtis put the matter before the Society at its next meeting, it led to a lively discussion and a resolution that any member encountering parasites forward them to Dr. Fitch. Unfortunately, nothing came of this resolution. Nevertheless, Dr. Fitch’s proposal was perhaps the first concrete suggestion to conduct “conventional” biological control, or the importation of insect parasites from a foreign land to help suppress an immigrant pest.³⁷

A report on Dr. Fitch’s biological control proposal appeared in the November, 1857, issue of the *Journal of the New York State Agricultural Society*, but it apparently attracted little attention.³⁸ Dr. Fitch mentioned more about his proposal in his sixth official report, published in the Society’s *Transactions* in 1861. This account was noticed in the preliminary report on the 1860 census, published in 1862. The Census Office inappropriately complimented

the State Agricultural Society for its philanthropic spirit in having “introduced into this country from abroad certain parasites which Providence has created to counteract the destructive powers of some . . . depredators.”³⁹ In 1867, B. D. Walsh, editor of the *Practical Entomologist*, recorded his opinion in his usual stinging style:

The real truth of the matter is, that the New York State Agricultural Society has done nothing of the kind, which the U. S. Census asserts that it has done; though, like certain other Societies, it has got the credit of actually doing a thing, because it simply talked about doing it. Unless my memory fails me, Dr. Fitch stated that he had written to that distinguished English Entomologist, Mr. Curtis, to send him living specimens of the parasites that infest the Wheat Midge in Europe, but that, as might have been naturally expected, no practical results followed from that application. How could it be otherwise? Who, in this dirty, selfish, mean little planet of ours – which, as Sterne has suggested, seems to have been made out of the refuse clippings from larger and better worlds – ever gives something for nothing?⁴⁰

Walsh then wrote an imaginary letter sarcastically setting down what Dr. Fitch might have written to Mr. Curtis.

Think my dear sir, for one moment, of our Midge-ridden farmers in New York! Think that, by sacrificing a few months of your time, and a few thousand dollars out of your own private pockets, you will put millions of dollars into the pockets of our wealthy State, and, eventually, hundreds of millions into the pockets of the whole United States! With your well-known philanthropic sentiments, can you possibly, for a single moment, resist the temptation of making the American people more rich and more prosperous than they already are?

You will please distinctly to understand, that neither the Congress of the United States, nor the Legislature of the State of New York, nor the New York State Agricultural Society, have appropriated one cent towards the furtherance of the above very important subject. It is possible, therefore, that in addition to your own personal expenses, you may have to pay, out of your own pocket, the freight and express charges on the packages of living Parasites sent from time to time to us. But even if you have to do this, think of the glory you will acquire by annually, for all time, adding hundreds of millions of dollars to the profits of the great American nation!⁴¹

Of course, Walsh’s purpose in writing this imaginary letter was to emphasize his criticism of government inactivity regarding Dr. Fitch’s simple, elegant, and sensible plan.

Although the plan was long ago recommended by some of the best entomologists in the country, Dr. Fitch for example, it has never been adopted, and probably never will be. Why? Because our Legislatures think that insects are such very minute objects, that they are unworthy of notice. . . .⁴²

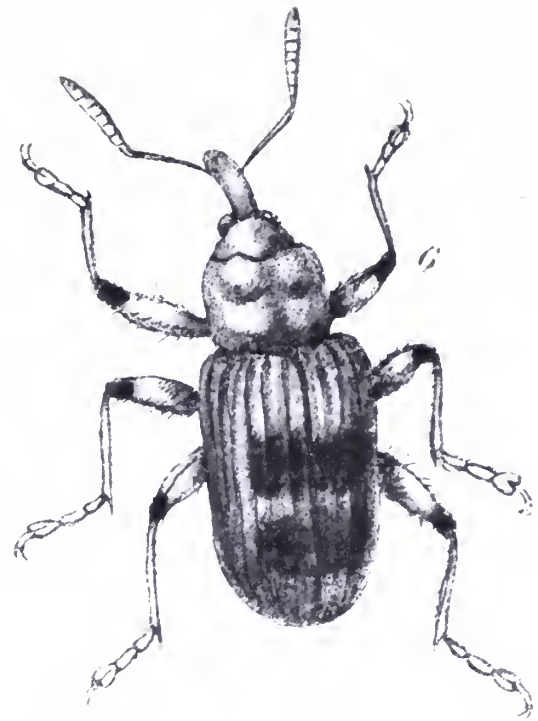
That Walsh and Fitch were exceptionally far-sighted is illustrated by another article by Walsh in the *Practical Entomologist* in 1866. Walsh pointed out that Dr. Fitch had observed that no American plant-feeding insect attacks toadflax, a European weed naturalized in much of North America. Dr. Fitch had speculated on the propriety of importing European insects known to feed on it and had also suggested importing some or all of the three parasitic insects known to control the wheat midge in Europe. Walsh said that we should not stop here, that the principle is of general application. “. . . Whenever a Noxious European Insect becomes accidentally domiciled among us, we should at once import the parasites and Cannibals that prey on it at home. . . . To attempt to fight them with the poor old-fashioned indigenous Cannibals and Parasites of America, is like sending out a fleet of old-fashioned wooden ships to oppose a fleet of ironclads.”⁴³

Because of Walsh's constant promotion of Dr. Fitch's idea, the first experiments in biological control by parasite importation were begun in the 1870's, primarily by Charles Valentine Riley.⁴⁴

Around 1860 the midge began to disappear from the wheat fields; it became progressively less destructive and ever since has been only local in its attacks. Dr. Fitch believed the United States had had the worst of this pest and that its career would be analogous to that of its predecessor, the Hessian fly, which declined after several years of spreading over the country and causing havoc in wheat fields. To him it seemed a law of nature that when an insect is introduced into a country with a favorable climate and vegetation it immediately multiplies and seizes a place in the arrangements of nature that does not belong to it and that it cannot continue to occupy.⁴⁵ In reality, wheat growers had begun to employ various methods to circumvent the midge, many of which had been endorsed by Dr. Fitch. They included deep plowing, crop rotation, late sowing of spring wheat, use of resistant varieties, and burning infested chaff and screenings after threshing the grain.⁴⁶

Pests of fruit trees occupied Dr. Fitch's attention continually, and he discussed them extensively in his publications. At one of his Yale University lectures in 1860, he stated that there were 60 known insect pests of apple, 12 of pear, 16 of peach, 17 of plum, 35 of cherry, and 30 of grape. Prominent among these was the plum curculio, which Dr. Fitch stigmatized as the country's worst insect pest.⁴⁷

The plum curculio is a native weevil that formerly fed on wild plum, hawthorn, and crabapple, but now also attacks cultivated plums, apples, peaches, cherries, and other



The plum curculio, Conotrachelus nenuphar (Herbst) (From I.P. Trimble, A Treatise on the Insect Enemies of Fruit and Fruit Trees [1865]).

fruits. In spring, the adult emerges from overwintering quarters and feeds on leaves and blossoms until the developing fruit appears. The female cuts through the skin and deposits a tiny, white egg, which she pushes to the bottom of the cavity with her snout. In front of the cavity she cuts a crescent-shaped slit that extends obliquely under the egg, leaving it in a flap of flesh. The larva feeds on the flesh for several weeks before maturing. Oviposition and feeding scar the fruit, which often becomes misshapen and drops prematurely from the tree.

According to Dr. Fitch, the plum curculio was recognized as a pest as early as the mid eighteenth century, and its ravages steadily increased early in the nineteenth century. Some of the early suggestions for its control provide a reminder of how desperate growers had become. Some felt that building a tight board fence nine feet high, furnished with a tight gate, around the orchard would provide relief. Others directed orchardists to pave the ground beneath the trees or apply salt plentifully at any season.⁴⁸ Dr. Fitch found that the most common remedy was one that had long been used in Europe against similar insects and had

been brought to public notice in this country by David Thomas, chief engineer of the Erie Canal west of Rochester and a distinguished horticulturist who frequently published in Rochester's widely circulated *Genesee Farmer*.⁴⁹ Thomas directed growers to spread sheets under the infested tree, then strike the trunk with a club or mallet. The



An apple scarred by the plum curculio (From I.P. Trimble, A Treatise on the Insect Enemies of Fruit and Fruit Trees [1865]).

sudden jar causes the weevils to fall to the sheets, where they can be picked up and destroyed. Due to the efforts of entomologists and horticulturists, this remedy became popular by the 1860's, and it has been pronounced a landmark in insect control because it was perhaps the first sensible recommendation for the control of orchard pests.⁵⁰

Dr. Fitch reviewed one other remedy for the curculio that was making the rounds of the agricultural press. A Mr. Cummings, of the *New York Observer*, suggested that as soon as the curculio appears a garden syringe should be used to drench plum foliage with a mixture of four ounces of sulfur, a pound of whale oil soap, four gallons of lime water, and four gallons of strong tobacco water. From his experience with other insects, Dr. Fitch felt that the tobacco water and whale oil soap would be useful, but he doubted that the lime water and sulfur made the mixture more efficacious.⁵¹

Sulfur had long been popular as an antidote to many insect pests. One of the most persistent recommendations for controlling caterpillars on fruit trees directed the grower to bore an auger hole in the trunk or main root of the infested tree, fill the hole with sulfur, and then plug it with wood from the same tree. The auger-hole remedy dates back at least to the seventeenth century, when brandy or rum was used instead of sulfur.⁵² Early in the nineteenth century sulfur became the chemical of choice due at least in



Shaking a tree to release the plum curculio and gathering the weevils, which will be destroyed (From I.P. Trimble, A Treatise on the Insect Enemies of Fruit and Fruit Trees [1865]).

part to the experiments of George Webster of Albany, which were publicized in the *Memoirs of the Board of Agriculture of the State of New York* in 1823 and extensively copied into other publications.⁵³

Webster's neighbors had been cutting down their caterpillar-infested trees because they were worried that the insect was that very venomous reptile called "the asp." In 1805, a large elm tree on his property was nearly defoliated by caterpillars. A passerby accosted him and said, "George, tis a pity to lose so fine a tree. . . . Send and get a little sulfur, and bore into the tree about six inches, and fill it with sulfur, and my word for it, not a caterpillar shall be seen after forty-eight hours." Webster did as he was instructed, later reporting there was not "the vestige of a caterpillar" on the tree in less than 48 hours. He suggested that two men could treat 200 trees in a day and speculated that the treatment would also prevent "the black rust" in peach, plum, and cherry trees.

It was readily apparent to Dr. Fitch that many people were assured of this remedy's efficacy simply because the

"worms" disappeared from the infested trees within a day or two after it was applied. He pointed out the fallacy in this argument: larvae of insects generally become most voracious and cause the most damage just as they are arriving at maturity. When fully grown they are most noticeable. Having nearly completed their growth, they are ready to leave the tree within a few days. People not conversant with the habits of the pests supposed their remedy drove them from the tree, but in reality it is their natural habit to abandon the tree at this time.⁵⁴

Dr. Fitch experimented by placing one caterpillar-infested cherry twig in a cup of moistened sulfur and another in a cup of water. Caterpillars on the twig in the cup of sulfur matured a third sooner than the others, and Dr. Fitch became convinced that the sulfur-plug remedy was nonsense. As news of the remedy's supposed efficacy spread and new variations appeared, Dr. Fitch, B. D. Walsh, and others fought back the humbugs. Dr. Fitch was particularly irritated with the supposed necessity of making the plug from wood of the same tree. In 1853, after an educated citizen suggested this remedy, he exhorted, "Methought he ought to have added, that the hole should be made with 'a silver bullet,' or at least that this operation should be done 'in the old o' the moon.'"⁵⁵

One offshoot of this traumatic cure for infested trees involved driving nails into them. Mr. Walsh, in his familiar style, made a mockery of this cure in 1866:

It is singular what a propensity just now men have to drive nails into fruit-trees, with the idea of benefiting them. some indeed prefer boring augur [sic] holes, but the nails seem the almost universal panacea of the day. Probably in 1867 it will be the fashion to take a draw knife and shave all the bark off the trees in every orchard; and in 1868 we shall reach the millenium of horticultural perfection, and dress off all our fruit-trees with a jack-plane to some mathematical figure.⁵⁶

Dr. Fitch could confidently recommend only the destruction of eggs or young larvae in winter or early spring to control caterpillars on fruit trees.⁵⁷

Dr. Fitch constantly encouraged the public to experiment with various means of subduing insect pests or shielding plants from their ravages. He also long felt a need for an efficient device for drenching trees and herbs with vegetable infusions and chemical solutions. He wanted an instrument "more capacious than the syringe and more economical than the garden engine." Among the many agricultural inventions then appearing was a hand pump that at first was labelled a "fire annihilator."⁵⁸ Capable of propelling water by both the upward and downward stroke of the handle, it could be conveniently carried around with a bucket of water, and it could throw water up to the roof of a two-and-a-half story building.

Upon receiving one of these implements for inspection, an assistant on the staff of the *American Agriculturist* aptly



The "Hydropult."

A bucket pump manufactured by the American Hydropult Company was advertised as a "new way of attacking insects" (From *American Agriculturist* 19:236 [1860]).

named it the "Hydropult." Finding that the instrument filled his need, Dr. Fitch encouraged the farmer to use it to treat pest insects "to a dose of tobacco water, aloes, quassia, and other bitter infusions, soap suds, weak lye, lime water, etc., and long before he has exhausted the pharmacopeia, we think he will come to something that is such an efficacious remedy for this insect, that, elated with the discovery, he will immediately let the world know it. . . ."⁵⁹ Finding Dr. Fitch's testimony encouraging, the American Hydropult Company of New York City started running advertisements in the *American Agriculturist* promoting their bucket pump as a "New Way of Attacking Insects."⁶⁰

In 1875, the Colorado potato beetle reached Washington County.⁶¹ Dr. Fitch was prepared. Four years earlier he had purchased four pounds of Paris green at a drug store, expecting that the beetles would soon reach his fields.⁶² Paris green was an arsenic-laden artists' pigment that tradition says was first produced commercially in Schweinfurt, Germany, in 1814.⁶³ In France, it came into use as a control for vineyard pests, and in America in the 1860's it was applied against the Colorado potato beetle, which was spreading eastward at an alarming rate. The introduction of Paris green as an insecticide launched a new era in the use of toxic substances for commercial purposes. One of the earliest strictly synthetic insecticides, it was the first such substance to be produced and traded on a significant scale. Thus, the insecticide era was underway shortly before Dr. Fitch retired from public service.⁶⁴

More than a century later it is impossible to estimate the economic impact of Dr. Fitch's work on insect control. Even estimates made in the nineteenth century seem frivolous and unsubstantiated. Before Dr. Fitch's sixth report was published, B. P. Johnson wrote, "The saving to many of our farmers and horticulturists, by observing the directions given in the reports published, have already amounted, we are confidently assured, to more, in a pecuniary point of

view, than the entire expenditure made for the promotion of agriculture by our State government."⁶⁵ Around 1868, one senator gave his "deliberate opinion" that the writings of Dr. Fitch had annually saved New York State the sum of \$50,000.⁶⁶ Whatever the actual case, Dr. Fitch's influence certainly went far beyond the sum he saved the farmers of New York State.

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The Later Years

During the later years of his appointment as Entomologist of the New York State Agricultural Society, Dr. Fitch's productivity as an author diminished considerably. His last few official reports were mere skeletons of earlier works. Words did not come easily, and writing was a burden.¹ Furthermore, in 1859, he had contracted pneumonia, which left his lungs impaired.² A decade later the infirmities of age began to appear. On the occasion of his sixtieth birthday he reviewed his personal condition:

Though I sensibly feel several of the infirmities of age creeping upon me more & more as time advances, none of these infirmities are so considerable yet as to incapacitate me from jogging along in my accustomed routine. A stiffness, disabling me from bending down to draw on boots or shoes, is the most annoying of anything. . . . In Albany last week, I weighed myself – 199 lbs. at evening, 195 next morning. I supposed I should exceed 200, it being occasionally remarked to me that I am getting corpulent – a fact I am myself aware of. With the little exercise I take this winter, I have little hunger or relish for food, and seldom does anything taste agreeable – though I manage to eat a pretty full meal thrice per day – & at 11 or 12 at night, I eat a dozen or more crackers with a glass of bottled cider, sweetened – this being the most delicious of anything that ever reaches my palate; and this does taste most refreshing & truly delicious, but it makes me so drowsy & dull I can do nothing after it, but read and drop to sleep in my chair, till 1 or oftener 2 o'clock, when I lie down, and sleep soundly, in the morning waking at 7 or 8, & often finding myself so stiff it is painful to stir, for a time, until my joints get limbered.³

In August of 1870, C. V. Riley, P. R. Uhler, and J. A.

Lintner visited Dr. Fitch at his home; 10 years later Riley described how they had found him. He had been ill for some time and was very much bowed down. The strong, tall man had become quite round-shouldered from the force of stooping in pursuit of his studies, while the constant use of the microscope had produced a noticeable contrast between his left and right eyes. Genial, enthusiastic, and unassuming, he made a favorable impression on his distinguished visitors.⁴

The State Agricultural Society was deteriorating at the same time. Secretary Johnson, the Society's leading spirit and a close, personal friend of Dr. Fitch, died in April of 1869. Dr. Fitch was convinced that the new corresponding secretary, Thomas L. Harison, was antagonistic to him and wanted to replace him with "a tool of his own – Lintner I presume. . . ."⁵ Lintner also began to appear antagonistic to Dr. Fitch, who found in the budding entomologist indications of empiricism and charlatanry. Lintner once informed Dr. Fitch about some recently discovered parasites of a pest insect without going into details, apparently to deny him the honor of determining the name of the parasite species. "He is following in Hall's footsteps quite evidently – that made Hall so contemptible in the eyes of Emmons & others who came to know his paltry secretiveness in such matters."⁶

In fact, James Hall, Director of the New York State Museum of Natural History, wanted to have entomology designated an official department of the Museum, leaving Lintner, then a Zoological Assistant, free to pursue studies in this line.⁷ Perhaps through Hall's efforts, Dr. Fitch's entomological position was abolished by the State Legislature effective October 1, 1872.⁸ Although the law that abolished it was passed in May, Dr. Fitch knew nothing of it until November 1 when he went to the *Cultivator* office. There he received a check for \$250, his quarter's salary, and he was told that the entomological appropriation was omitted

from the bill last winter, thus ending his payments. He was surprised he had not known this earlier, although he had many indications of the indifference of Harison on this subject. He felt that it was anything but courteous to omit this item from the bill without telling him. Secretary Johnson had always promptly informed him when there had been any risk it would be struck from the bill so he could be on hand to argue for its retention.

It was evident that the Society, now under very different management, was rapidly degenerating. However, Dr. Fitch felt the appropriation had been continued much longer than originally expected and that he was getting too old to continue with the task. In fact, a feeling of great relief accompanied his release from it. All he wanted was an appropriation for having his reports revised and published in their entirety. He privately suspected that Hall figured actively in this affair and had obtained an appropriation for an entomologist and botanist for the State Cabinet in place of his entomological appropriation.⁹

In January of 1873, Dr. Fitch wrote to the Executive Committee of the State Agricultural Society, curtly requesting to be excused from serving further as Entomologist of the Society. He was so convinced the Society wanted to get rid of him that self-respect would not allow him to continue in its service.¹⁰ In 1874, Lintner was placed in charge of the entomological work of the State Museum, and the collection of insects that Dr. Fitch made for the Agricultural Society was placed in his care.¹¹ In 1880, in accordance with a provision made by the State Legislature for replacing Dr. Fitch, Lintner was appointed entomologist by Governor Cornell.¹² In 1881, he was appointed State Entomologist and charged with studying insects injurious to agriculture and devising methods for their control. He was required to render an annual report of his investigations to the Legislature and to arrange for the State Museum a collection of insects taken in the course of his labor.¹³ Finally, in 1883, Lintner, as State Entomologist, was made a member of the scientific staff of the State Museum.¹⁴ He continued to serve in that capacity until his death in 1898.

About five months after Dr. Fitch retired, the State Legislature appropriated \$1500 for the revision and completion of his reports for publication.¹⁵ He completed the revision, and in 1875 it was presented to the Legislature. A resolution for printing 2000 copies under the direction of the Board of Regents of the University was passed by the Assembly, but it failed to receive concurrence from the Senate.¹⁶ Two years later, Secretary Harison proposed to Joseph Henry that the Smithsonian Institution publish the revision, but apparently nothing resulted from that proposal.¹⁷ By 1883, Lintner was unable to locate the manuscript.¹⁸

Dr. Fitch, now 66 years old, was becoming increasingly feeble. He passed his remaining years working on his insect collection, the history of Washington County, the Fitch family genealogy, and occasional civic and church affairs. They were in some respects sad and difficult years. He cared little about personal appearance and was plagued by



Joseph Albert Lintner (New York State Museum file photograph).

financial woes and family misfortune. His daughter Sarah returned to Salem with two children and three stepchildren while her husband attempted to succeed as a southern cotton grower after the Civil War. Taking care of her and her family and putting his son Elias Pattison through law school hindered Dr. Fitch's ability to discharge the mortgage on his farm, which he wanted to leave unencumbered to his children and grandchildren.¹⁹ His grandson Charles Horace died in 1875, and his beloved son Asa James, whom he had hoped might follow in his footsteps and advance the work in entomology, died in 1877.²⁰ To make matters worse, Elias Pattison had moved to the West, was not heard from after 1875, and was feared dead.²¹

After Chicago burned in 1871, Dr. Fitch decided to move his office further from the house, so that if the latter burned, the office and its contents might be saved.²² He valued his cabinet of insects at \$5000, his library of some 1500 volumes at \$2000, and the sum of his personal property at \$10,500.²³ In the office, amid the accumulated clutter of many years of hard work, he tried to put his collection and manuscript notes in order. However, even after retirement he remained a poor correspondent and was out of contact

with the entomological community. C. V. Riley, who revered Dr. Fitch, asked to be allowed to put the veteran entomologist's name on the list of contributors to the *American Entomologist*, of which he was Junior Editor. His senior, B. D. Walsh, had died from injuries sustained in a freak train accident, and Riley was left to run the journal without assistance. Apparently, he never even received a reply from Dr. Fitch.²⁴

The development of a federal entomological commission, however, rekindled Dr. Fitch's desire to serve the public, although he was 67 years old at the time of its formation. Riley had lobbied for a national commission to fight the scourges of the Rocky Mountain locust, and after the United States Entomological Commission was finally authorized in 1876, he was appointed Chairman; A. S. Packard, Jr. and Cyrus Thomas were appointed Secretary and Treasurer.²⁵ Dr. Fitch learned of this from an item in a newspaper that he read just after beginning preparations to apply to the Secretary of the Interior for an appointment on the Commission. He was greatly disconcerted and dejected by this news.²⁶

For many years, Dr. Fitch had been accumulating information on the Fitch family genealogy. In retirement he devoted much of his time to compiling and arranging his records of the family in America and England.²⁷ It was a labor of love, and he felt that if his life, "now verging toward the climacteric of 'three score years and ten,'" should not be spared long enough to finish the undertaking, he might at least leave it sufficiently complete that another person could finish it.²⁸ From his vast knowledge of Washington County, Dr. Fitch contributed material for Crisfield Johnson's *History of Washington Co., New York*, which was published in 1878.²⁹ Of course, he was a valued member of his church, the United Presbyterian Church of Salem. In 1867, he had the honor of addressing the congregation on the occasion of the centennial anniversary of their "Old White Church." It was apparently a rousing address:

I began, "Gentlemen & Ladies" my loud, clear voice, & deliberate manner, I was at once conscious was just right – "Sons & daughters of the Old White Church in Salem" – I was speaking easy, loud, & plain – distinctly heard by the most distant one in the audience – . . . "I come before you in one short hour to relate the incidents of a hundred years" – I was aware the audience was listening with the most vivid attention, & were taking the deepest interest in what I uttered – Cole [Editor of the *Salem Press*] tells me, a man in the gallery close to him, got up, as I ascended the pulpit, muttering to himself "I can't stay any longer" – & pausing to hear the first words, – "I must hear that" he said, & sat down, for some 15 mts. when he sprang up, saying in an undertone "I mustn't stay any longer; I must go; it's too bad" and with



United Presbyterian Church, Salem, New York.

the utmost reluctance evident in his manner, he tore himself away.³⁰

In 1868, the congregation surreptitiously paid \$30 on Dr. Fitch's behalf for a diploma of life membership in the American Bible Society, and in 1870 they paid \$150 for a diploma certifying that he was made a Life Director of the Society.³¹

A severe cold spell besieged Salem in January of 1879, and Dr. Fitch noticed a sore throat and cold developing.³² He began to feel slight stitches of pain in the lower part of his lungs and surmised they were caused by breathing cold air.³³ Chronic nosebleeds left him so weak and unsteady that on February 12 he was unable to attend a meeting of the Evergreen Cemetery Association, of which he had been President since 1863.³⁴ On March 6, he felt so feeble that he considered it unsafe to remain in his office alone through the night, not knowing what might happen to him. He decided to sleep on a bed in the house, something he rarely did.

On April 8, Dr. Fitch died at the age of 70 years. He was buried in Evergreen Cemetery, where a family monument bears on one side an inscription devoted to him:

Asa Fitch
Physician and Naturalist
Born Died
Feb. 24, 1809 April 8, 1879
Eminent among compatriots:
Fame had not the power to win
from him humbleness of spirit,
purity of soul, modesty of
demeanor, charity and love
for his fellow men.

The local community, as well as the entomological community at large, mourned his death. The *Troy Morning Whig* carried the following encomium:

"He was quiet, gentle, and unobtrusive in all his ways. He never sought the applause of men, although he often deserved it, and has behind him the record of a life devoted to the study of the minuter works of creation – minuter, however, only to the outward seeming, for in their beautiful formations, this skilful, practiced student of nature saw the handiwork of God revealed in wondrous beauty."³⁵

In the *Popular Science Monthly*, E. P. Thurston wrote, "His life was full of strong, pure manhood – full of such labor and study as few men have physical power to endure – full of the gentleness, the kindness, and peace which come of well-living, and full of the honors which his labors had earned."³⁶

In the *American Entomologist*, C. V. Riley, one of the new arbiters of American economic entomology, wrote:

In the death of Dr. Asa Fitch, Economic Entomology in this country has lost its oldest and ablest votary, and as a follower in the paths he so worthily trod, we reverently pay brief tribute to the memory of one who spent the larger part of his life in the untiring and successful study of the insects injurious to agriculture and horticulture. While his earlier writings were contemporaneous with those of Harris, and his later ones with those of Walsh, he will, judged by the work he did, rank first among the fathers of applied entomology in America.³⁷

According to some scholars, by the time of Dr. Fitch's death people were becoming less religious and more doubtful of the ability of individuals to improve themselves. Darwin's theory of evolution played an important role in the destruction of the Victorian world view and the preoccupation with the pursuit of rational order. People became anxious to embody their cultural values in institutions. Following a period of revolutionary developments in American agriculture, the Morrill, Hatch, Adams, and Smith-Lever Acts of the 1860's to early 1900's established the agricultural teaching, research, and extension network and created the first considerable market for economic entomologists in the United States. Professional entomology in America came of age. By 1894, 42 states and territories had employed entomologists. The image of Dr. Asa Fitch was their standard.³⁸

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- ¹⁸J. A. Lintner, *First Annual Report on the Injurious and Other Insects of the State of New York* (Albany, 1882), pp. 296-297.
- ¹⁹Diary, 25 Dec. 1865, 8 Dec. 1867, 21 May 1869, 24 Aug. 1869, 25 Apr. 1870, 10 July 1878; M. A. Marston, the lady of the diary, or the little Yankee goes South, undated, Manuscript Group 2086, Department of Manuscripts & University Archives, Cornell University Libraries; A. M. Fitch-Andrews, *Genealogy*, pp. 54-58, Manuscript Group 215 (Asa Fitch Papers), Sterling Memorial Library (Manuscripts and Archives), Yale University (hereafter cited as Fitch-Andrews, *Genealogy*).
- ²⁰Diary, 17 Aug. 1865, 3 June 1875, 20 Nov. 1877; A. Fitch, A photostat copy of some Fitch genealogy notes, undated, New York State Library.
- ²¹Fitch-Andrews, *Genealogy*, p. 59.
- ²²Diary, 16 Nov. 1869, 31 Oct. 1871.
- ²³*Ibid.*, 2 July 1870.
- ²⁴C. V. Riley to A. Fitch, letter dated 12 Dec. 1869, New York State Museum.
- ²⁵A. Mallis, *American Entomologists* (New Brunswick, Rutgers University Press, 1971), p. 74.
- ²⁶Diary, 30 Mar. 1877.
- ²⁷Fitch-Andrews, Asa Fitch.
- ²⁸A. Fitch, Fitch Family (circular), 1874, New York State Archives.
- ²⁹Diary, 14 May 1878, 2 Aug. 1878.
- ³⁰*Ibid.*, 27 Aug. 1867.
- ³¹*Ibid.*, 6 Oct. 1868, 29 Sept. 1870.
- ³²*Ibid.*, 14 Jan. 1879.
- ³³*Ibid.*, 17 Jan. 1879.
- ³⁴*Ibid.*, 28 Jan. 1879, 20 Feb. 1879, 24 Feb. 1879; A. Fitch to Evergreen Cemetery Association, letter dated 12 Feb. 1879, Dr. Asa Fitch Historical Society, Salem, N. Y.; C. Johnson, *History of Washington Co., New York* (Philadelphia: Everts & Ensign, 1878), p. 187.
- ³⁵Anon., Death of Asa Fitch, M. D., *Troy Morning Whig* 45(9 Apr. 1879): 2.
- ³⁶E. P. Thurston, Sketch of Dr. Asa Fitch, *Pop. Sci. Monthly* 16(1879): 116-120.
- ³⁷Riley, Dr. Fitch.
- ³⁸J. K. Barnes, Insects in the new nation: a cultural context for the emergence of American entomology, *Bull. Entomol. Soc. Amer.* 31(1985): 21-30.

Entomological Publications by Dr. Asa Fitch

In the following list, bibliographic data are presented for 222 entomological research reports, popular articles, and other communications written by Dr. Fitch. Works that are full or partial reprints, compilations, revisions, or other forms of repetition are noted as such. Thorough annotations regarding many of Dr. Fitch's publications can be found in J. A. Lintner's *First Annual Report on the Injurious and Other Insects of the State of New York* (Albany, 1882, pp. 291-325).

All of Dr. Fitch's official reports on the noxious, beneficial, and other insects of New York State, except the twelfth, thirteenth, and fourteenth, were printed in more than one edition. The original editions, published in the *Transactions of the New York State Agricultural Society*, are generally scarce and have been since before the turn of the century. The failure of many subsequent scholars to cite the earliest edition has resulted in numerous inconsistencies and much confusion in citing Dr. Fitch's works. Also, many scholars who cited the first edition failed to give the correct publication date, perhaps because the *Transactions* for any one year were usually published a year or more later. Because his reports (except the eleventh) contain descriptions of new taxa, it is especially important that accurate bibliographic data be available. Lintner presented a bibliography of the Fitch reports in his *First Annual Report*, which is now also rare. More recently, Louise M. Russell gave a careful bibliography that is generally available (*Ann. Entomol. Soc. Amer.* 53 [1960]:326-327).

Even in these carefully compiled bibliographies, inaccurate data are preserved. Several issues of the *Transactions* bear inaccurate publication dates. The volume of *Transactions* for 1856, containing Dr. Fitch's third report, bears an 1856 publication date. However, in his report, Dr. Fitch refers to the year of authorship as 1857, and the *New York State Assembly Journal* indicates that the Senate and Assembly did not concur on a resolution to print the volume until

April 14, 1857. The volume of *Transactions* for 1869, containing the thirteenth report, bears the date 1870, but Dr. Fitch's notes on species described in that volume indicate it was published in February of 1871. The volume for 1870, containing the fourteenth report, has two title pages. One bears the date 1871; the other, 1872. That volume contains a certified copy of the Society's constitution dated February 26, 1872. Dr. Fitch's notes also indicate that it was published in February of 1872.

1845a. An essay upon the wheat-fly, and some species allied to it. Albany. 32 pp.
(Reprint of 1845c.)

1845b. Insects injurious to vegetation. — No. 2. Insects of the genus *Cecidomyia*, including the Hessian fly and wheat fly. *Amer. Q. J. Agric. & Sci.* 1:255-269.

1845c. Insects injurious to vegetation. — No. 3. The wheat-fly. *Amer. Q. J. Agric. & Sci.* 2:233-264.

1846a. An essay upon the wheat-fly, and some species allied to it. Albany. 38 pp.
(From *Trans. N. Y. St. Agric. Soc.*, according to the National Union Catalog of Pre-1956 Imprints; presumably a reprint of 1846f; I have not seen a copy of this publication.)

1846b. The Hessian fly. *Amer. Farmer* (4th Series) 2:179-183.
(Partial reprint of 1846d.)

1846c. The Hessian fly, its history, character, transformations, and habits. Albany. 63 pp.
(Compilation of 1846d and 1847e.)

1846d. Insects injurious to vegetation. — No. IV. The Hessian fly. *Amer. Q. J. Agric. & Sci.* 4:244-264, 257*-264*.

1846e. Letter from Dr. Fitch — respecting the essay on the wheat fly. *Ohio Cultivator* 2:51.

- 1846f. The wheat-fly. Trans. N. Y. State Agric. Soc. 5(1845):255-291.
(Revision of 1845c.)
- 1847a. The grain moth – *Tinea granella*. Cultivator (2nd Series) 4:13-14.
- 1847b. The Hessian fly. Amer. Farmer (4th Series) 2:200-205.
(Partial reprint of 1846d.)
- 1847c. The Hessian fly: its history, character, transformations, and habits. Albany. 60 pp.
(Reprint of 1847d.)
- 1847d. The Hessian fly: its history, character, transformations, and habits. Trans. N. Y. State Agric. Soc. 6(1846):316-373.
(Revision of 1846d and 1847e.)
- 1847e. Insects injurious to vegetation. – No. V. The Hessian fly. – (continued). Its characters, transformations, and habits. Amer. J. Agric. & Sci. 5:1-27.
- 1847f. List of noxious insects. Amer. J. Agric. & Sci. 6:145-152.
- 1847g. Winter insects of eastern New York. Amer. J. Agric. & Sci. 5:274-284.
- 1848a. The American currant moth, (*Abraxas? ribearia*). Albany. 11 pp.
(Reprint of 1848b.)
- 1848b. The currant-moth, *Abraxas? ribearia*. Trans. N. Y. State Agric. Soc. 7(1847):461-469.
- 1849a. Catalogue of the insects in the State Cabinet of Natural History, December 1, 1848, pp. 27-39. In Second annual report of the Regents of the University, on the condition of the State Cabinet of Natural History, with catalogues of the same. Made to the Senate January 12, 1849. Albany. 103 pp.
- 1849b. A historical, topographical and agricultural survey of the county of Washington. Part first. Trans. N. Y. State Agric. Soc. 8(1848):877-975.
1850. A historical, topographical and agricultural survey of the County of Washington. Part second – part fifth. Trans. N. Y. State Agric. Soc. 9(1849):753-944.
- 1851a. Catalogue with references and descriptions of the insects collected and arranged for the State Cabinet of Natural History, pp. 43-69. In Fourth annual report of the Regents of the University, on the condition of the State Cabinet of Natural History, and the historical and antiquarian collection, annexed thereto. Made to the Senate, January 14, 1851. Albany. 146 pp.
(The established publication date of this catalogue is February 28, 1851. See J. N. Y. Entomol. Soc. 92(1984):27-34.)
- 1851b. Wheat insects – joint-worm. Cultivator (2nd Series) 8:321-324.
- 1852a. (untitled) J. N. Y. State Agric. Soc. 3:37.
- 1852b. Striped blistering fly. J. N. Y. State Agric. Soc. 3:55.
- 1853a. Apple tree pests. Schonherr's weevil and the orchard moth. Salem Press, July 12 (unpaged).
- 1853b. Apple tree pests. Schonherr's weevil, and the orchard moths. J. N. Y. State Agric. Soc. 4:36-39.
(Reprint of 1853a, with additional material.)
- 1854a. Apple tree pests. Schonherr's weevil and the orchard moth. Trans. N. Y. State Agric. Soc. 13(1853):178-187.
(Reprint of 1853b.)
- 1854b. Insect survey. J. N. Y. State Agric. Soc. 5:36-37.
- 1854c. Insects of Algiers, from the Museum of Natural History of Paris. Trans. N. Y. State Agric. Soc. 13(1853):369-379.
- 1854d. Plant-lice, drouth, etc. J. N. Y. State Agric. Soc. 5:37.
- 1855a. The chinch bug. Comments on the above by Dr. Fitch. Cultivator (3rd Series) 3:237-239.
(Reprint of 1855c.)
- 1855b. *Coccus arborum-linearis*, Geoff. Proc. Entomol. Soc. Lond. 3:77-78.
- 1855c. Entomology. The chinch bug. Comments on the above by Dr. A. Fitch. Country Gentleman 5:396.
- 1855d. Entomology. No. IV. – The apple plant louse. Country Gentleman 6:48.
- 1855e. Entomology – No. IV. The apple plant louse. Cultivator (3rd Series) 3:278-279.
(Reprint of 1855d.)
- 1855f. Entomology – No. V. Insects which destroy plant lice. Country Gentleman 6:158-159, 174-175.
- 1855g. Entomology. No. 6 – Gaylord's wheat-caterpillar. Country Gentleman 6:331.
- 1855h. Entomology. No. 7 – The wheat thrips and three-banded thrips. Country Gentleman 6:385-386.
- 1855i. First report on the noxious, beneficial and other insects, of the State of New-York. Made to the State Agricultural Society, pursuant to an appropriation for this purpose from the legislature of the state. Albany. 180 pp.
(Reprint of 1855n.)
- 1855j. The hunter weevil. Country Gentleman 5:373.
- 1855k. The hunter weevil. Cultivator (3rd Series) 3:221.
(Reprint of 1855j.)
- 1855l. Osage orange insect. Country Gentleman 5:38-39.
- 1855m. Plum tree caterpillars. Country Gentleman 5:234.

- 1855n. Report. Trans. N. Y. State Agric. Soc. 14(1854):705-880.
(*This report is generally known as Fitch's First Report.*)
- 1856a. Entomology. No. 6 – Gaylord's wheat-caterpillar. Cultivator (3rd Series) 4:19.
(*Reprint of 1855g.*)
- 1856b. Entomology. No. 8 – Cut-worms. Country Gentleman 7:154-155, 171.
- 1856c. Entomology. No. 8 – Cut-worms. Cultivator (3rd Series) 4:115-116.
(*Reprint of 1856b.*)
- 1856d. Entomology. No. IX. – The American vapor-er moth. Country Gentleman 7:217-218, 235.
- 1856e. Entomology. No. IX. – The American vapor-er moth. Cultivator (3rd Series) 4:154-156.
(*Reprint of 1856d.*)
- 1856f. Entomology. No. X. – Borer in apple trees – the *Buprestis*. Country Gentleman 8:27.
- 1856g. Entomology. No. X. – Borer in apple trees – the *Buprestis*. Cultivator (3rd Series) 4:240-241.
(*Reprint of 1856f.*)
- 1856h. Entomology. No. XII. – The rose-bug. Country Gentleman 8:75-76.
- 1856i. Entomology. No. XII. – The rose-bug. Cultivator (3rd Series) 4:270-271.
(*Reprint of 1856h.*)
- 1856j. First and second report on the noxious, beneficial and other insects, of the State of New-York. Made to the State Agricultural Society, pursuant to an appropriation for this purpose from the legislature of the state. Albany. 336 pp.
(*Reprint of 1855n and 1856l.*)
- 1856k. The joint worm in barley. J. N. Y. State Agric. Soc. 7:76.
- 1856l. Report on the noxious, beneficial and other insects of the State of New-York. Trans. N. Y. State Agric. Soc. 15(1855):409-559.
(*This report is generally known as Fitch's Second Report.*)
- 1857a. Cut-worms (*Viviparous*, S.). J. N. Y. State Agric. Soc. 8:22.
- 1857b. Entomology. Boston Cultivator, January 31.
- 1857c. Entomology. No. 13 – The prickly *Leptostylus* – a worm under the bark of apple trees. Country Gentleman 9:78.
- 1857d. Entomology. No. 13 – The prickly *Leptostylus* – a worm under the bark of apple trees. Cultivator (3rd Series) 5:77-78.
(*Reprint of 1857c.*)
- 1857e. Entomology. No. XIV. – Insects imbedded in the interior of wood. Country Gentleman 9:201-202.
- 1857f. Entomology. No. XIV. – Insects imbedded in the interior of wood. Cultivator (3rd Series) 5:138-139.
(*Reprint of 1857e.*)
- 1857g. Entomology. No. 15 – Grasshoppers. Answer to the above by Dr. Fitch. Country Gentleman 10:42-43.
- 1857h. Entomology. No. 15 – Grasshoppers. Cultivator (3rd Series) 5:245-246.
(*Reprint of 1857g.*)
- 1857i. Entomology. – No. 16. The hunter weevil in young corn. Beetles upon and worms in potato vines. Gooseberry insects. Country Gentleman 10:91.
- 1857j. Entomology – No. 16. The hunter weevil in young corn. Beetles upon, and worms in, potato vines. Gooseberry insects. Cultivator (3rd Series) 5:273.
(*Reprint of 1857i.*)
- 1857k. The may-beetle. Genesee Farmer (2nd Series) 18:239-241.
- 1857l. Slug worm. Country Gentleman 10:145.
- [1857m.] Third report on the noxious and other insects of the State of New-York. Trans. N. Y. State Agric. Soc. 16(1856):315-490.
(*The publication date printed in the Transactions, 1856, is apparently a misprint. In his report, Dr. Fitch refers to the year of authorship as 1857, and the New York State Assembly Journal indicates that the Assembly and Senate did not concur on a resolution to print the Transactions for 1856 until April 14, 1857.*)
- 1857n. Weevil in seeds from the Patent Office. J. N. Y. State Agric. Soc. 8:29.
- 1857o. Wheat midge. J. N. Y. State Agric. Soc. 8:67-68.
- 1858a. The entomologist. The fall web-worm – No. XVII. Country Gentleman 12:239.
- 1858b. Entomology – No. 16. Experiments – Soap on apple trees – Powdered charcoal on cucumber plants. Country Gentleman 12:15.
- 1858c. Entomology – No. 16. Experiments – soap on apple trees – powdered charcoal on cucumber plants. Cultivator (3rd Series) 6:238-239.
(*Reprint of 1858b.*)
- 1858d. The fall web-worm – No. XVII. Cultivator (3rd Series) 6:341-342.
(*Reprint of 1858a.*)
- 1858e. Fourth report on the noxious and other insects of the State of New-York. Trans. N. Y. State Agric. Soc. 17(1857):687-753.
- 1858f. Injurious insect on the oak. Country Gentleman 12:74.

- 1858g. Say's heteropterous Hemiptera. Trans. N. Y. State Agric. Soc. 17:754-814.
- 1858h. Wheat midge. Trans. N. Y. State Agric. Soc. 17 (1857):319-320.
(Reprint of 1857o.)
- 1859a. The entomologist. XVIII – The golden tortoise beetle. Country Gentleman 13:50.
- 1859b. Entomology. No. XIX. – Beetles infesting grapevines. Country Gentleman 14:171.
- 1859c. Entomology. No. XX. – The parasitic destroyer of the *Curculio*. Country Gentleman 14:221.
- 1859d. Fifth report on the noxious and other insects of the State of New York. Trans. N. Y. State Agric. Soc. 18(1858):781-854.
- 1859e. Maple leaf-cutter. Country Gentleman 14:225.
- 1859f. Maple leaf-cutter. Cultivator (3rd Series) 7:330-331.
(Reprint of 1859e.)
- 1859g. A new barley insect. Country Gentleman 13:250.
(Reprint of 1859i.)
- 1859h. A new barley insect. Cultivator (3rd Series) 7:148.
(Reprint of 1859i.)
- 1859i. A new barley insect. J. N. Y. State Agric. Soc. 9:114-115.
- 1859j. No. XX. – The parasitic destroyer of the *Curculio*. Cultivator (3rd Series) 7:340-341.
(Reprint of 1859c.)
- 1859k. Third, fourth, and fifth reports on the noxious, beneficial and other insects, of the State of New York. Made to the State Agricultural Society, pursuant to an appropriation for this purpose from the legislature of the state. Albany. 324 pp.
(Reprint of 1856m, 1858e, and 1859d.)
- 1859l. The thousand-legged worm. Answer to the above by Dr. Fitch. Country Gentleman 14:27.
- 1859m. The thousand-legged worm. Answer to the above by Dr. Fitch. Cultivator (3rd Series) 7:254.
(Reprint of 1859l.)
- 1860a. Address of Asa Fitch M. D., Entomologist of the Society, on the *Curculio* and black knot on plum trees. Pages 15-28 in *The most pernicious species of United States insects, and the Curculio*, two addresses delivered at the annual meetings of the New York State Agricultural Society, A. D. 1859 and 1860. By Asa Fitch, M. D., Entomologist of the Society. Albany. 28 pp.
(Reprint of 1860b.)
- 1860b. Address of Asa Fitch M. D., Entomologist of the Society, on the *Curculio* and black knot on plum trees. Trans. N. Y. State Agric. Soc. 19(1859):599-612.
- 1860c. Address, on our most pernicious insects, delivered at the annual meeting, February, 1859. Pages 3-13 in *The most pernicious species of United States insects, and the Curculio*, two addresses delivered at the annual meetings of the New York State Agricultural Society, A. D. 1859 and 1860. Albany. 28 pp.
(Reprint of 1860d.)
- 1860d. Address, on our most pernicious insects, delivered at the annual meeting, February, 1859. Trans. N. Y. State Agric. Soc. 19(1859):588-598.
- 1860e. The apple insect. Country Gentleman 16:32-33.
- 1860f. The apple insect. Cultivator (3rd Series) 8:260.
(Reprint of 1860e.)
- 1860g. Entomological department. No. XXI – Locust leaf-miners. Country Gentleman 15:82.
- 1860h. The entomologist. No. 22 – The seventeen year cicada. Country Gentleman 15:210.
- 1860i. The entomologist. – No. 23. – The striped flea-beetle. Country Gentleman 16:36.
- 1860j. The entomologist. No. 24. – The pear blight beetle. Country Gentleman 16:302-303.
- 1860k. The entomologist. No. 24. – The pear blight beetle. Cultivator (3rd Series) 8:371.
(Reprint of 1860j.)
- 1860l. Entomology. Country Gentleman 15:384.
- 1860m. No. 23. – The striped flea-beetle. Cultivator (3rd Series) 8:270.
(Reprint of 1860i.)
- 1860n. Ravages of insects on forest and fruit trees – remedy. Albany Express, July 2.
- 1860o. Ravages of insects on forest and fruit trees – remedy. J. N. Y. State Agric. Soc. 11:21-22.
(Reprint of 1860n, with additional material.)
- 1860p. Ravages of insects on forest and fruit trees – remedy. Trans. N. Y. State Agric. Soc. 19(1859):775-776.
(Reprint of 1860o.)
- 1860q. The wonders of insect life. Country Gentleman 15:146-147.
(Extracted from 1855n.)
- 1861a. (untitled). Country Gentleman 18:96.
- 1861b. (untitled). Cultivator (3rd Series) 9:290.
(Reprint of 1861a.)
- 1861c. The army worm and cut worm. J. N. Y. State Agric. Soc. 12:3.
- 1861d. The army worm and cut worm. Field Notes, July 13.
(Reprint of 1861c.)
- 1861e. The army-worm moth. Boston Cultivator 23:275.

- 1861f. The army-worm's parasite. Boston Cultivator 23:276.
- 1861g. The bean weevil. Trans. R. I. Soc. Encouragement Domestic Ind. 1860:62-64.
- 1861h. The black blistering fly. Country Gentleman 18:193.
- 1861i. The black blistering fly. Cultivator (3rd Series) 9:325.
(Reprint of 1861h.)
- 1861j. The cut worm and corn grub killer. Country Gentleman 18:33.
(Reprint of 1861l.)
- 1861k. The cut worm and corn grub killer. Cultivator (3rd Series) 9:259.
(Reprint of 1861l.)
- 1861l. The cut worm and corn grub killer. J. N. Y. State Agric. Soc. 12:10.
- 1861m. Disappearance of the wheat-midge. Amer. Farmer 2:378-379.
- 1861n. The entomologist. The army worm and cut worm. Country Gentleman 18:18.
(Reprint of 1861c.)
- 1861o. The entomologist. No. 25 – The quince *Tingis*. Country Gentleman 17:114.
- 1861p. The entomologist. No. 26 – The wheat midge. Country Gentleman 17:226.
- 1861q. The entomologist. No. 27 – Disappearance of the wheat midge. Country Gentleman 17:290.
- 1861r. The entomologist. No. 28 – Apple tree borer. Country Gentleman 17:370.
- 1861s. The entomologist. No. 29 – The army worm moth. Country Gentleman 18:66.
- 1861t. The entomologist. No. 30. – The grain *Aphis*. Country Gentleman 18:114.
- 1861u. The entomologist. Snapping beetle – blight on apple trees. Country Gentleman 18:130.
- 1861v. The grain *Aphis*. N. Y. Observer 39(2):336.
- 1861w. The hunter weevil. Country Gentleman 18:80.
- 1861x. The hunter weevil. Cultivator (3rd Series) 9:268.
(Reprint of 1861w.)
- 1861y. An important caution. Country Gentleman 18:161.
- 1861z. An important caution. Cultivator (3rd Series) 9:303.
(Reprint of 1861y.)
- 1861aa. The locust insect. Country Gentleman 18:161.
- 1861bb. The new insect in rye. Amer. Agric. 20:235-236.
- 1861cc. The new insect upon grain fields. J. N. Y. State Agric. Soc. 12:17-18.
- 1861dd. No. 26 – The wheat midge. Cultivator (3rd Series) 9:150-151.
(Reprint of 1861p.)
- 1861ee. No. 27 – Disappearance of the wheat midge. Cultivator (3rd Series) 9:178.
(Reprint of 1861q.)
- 1861ff. No. 28 – Apple tree borer. Cultivator (3rd Series) 9:209.
(Reprint of 1861r.)
- 1861gg. No. 29 – The army worm moth. Cultivator (3rd Series) 9:278-279.
(Reprint of 1861s.)
- 1861hh. Sixth report on the noxious and other insects of the State of New York. Trans. N. Y. State Agric. Soc. 20(1860):745-868.
- 1861ii. Snapping beetle – blight on apple trees. Cultivator (3rd Series) 9:294.
(Reprint of 1861u.)
- 1861jj. Worm on grape vines. J. N. Y. State Agric. Soc. 11:39.
(Reprint of 1861kk.)
- 1861kk. Worm on grape vines. Trans. N. Y. State Agric. Soc. 20(1860):342-343.
- 1862a. The buffalo tree-hopper the cause of scars on the twigs of fruit trees. Amer. Agric. 21:172-173.
- 1862b. The entomologist. Entomological events of the past year. Country Gentleman 19:124-125.
- 1862c. The entomologist. No. 31. – Insect tumors and wounds in raspberry stalks. Country Gentleman 19:335.
- 1862d. The entomologist. No. 31. – Insect tumors and wounds in raspberry stalks. Cultivator (3rd Series) 10:189.
(Reprint of 1862c.)
- 1862e. The entomologist. No. 32 – The asparagus beetle. Country Gentleman 20:81-82.
- 1862f. The entomologist. No. 32 – The asparagus beetle. Cultivator (3rd Series) 10:274-275.
(Reprint of 1862e.)
- 1862g. The entomologist. No. 33 – The maple *Psocus*. Country Gentleman 20:162.
- 1862h. The grain *Aphis*. Prairie Farmer 10:291-292.
- 1862i. Insects the past year. J. N. Y. State Agric. Soc. 12:72.
(Reprint of 1862b.)
- 1862j. Insects the past year. Trans. N. Y. State Agric. Soc. 21(1861):27-31.
(Reprint of 1862b.)
- 1862k. Seventh report on the noxious and other insects of

- the State of New York. Trans. N. Y. State Agric. Soc. 21(1861):813-859.
- 1863a. Borers in the honey locust. J. N. Y. State Agric. Soc. 13:19.
- 1863b. Borers in the honey locust. Trans. N. Y. State Agric. Soc. 22(1862):117-118.
- 1863c. A brief account of the most important injurious insects of the United States. Albany. 29 pp.
(*Reprint of 1863j.*)
- 1863d. Club wheat – our views on it. Country Gentleman 22:33.
- 1863e. Eighth report on the noxious and other insects of the State of New York. Trans. N. Y. State Agric. Soc. 22(1862):657-691.
- 1863f. The entomologist. The may beetle. Worm on grapevines. Country Gentleman 21:399.
- 1863g. The entomologist. The onion fly. Country Gentleman 21:63.
(*Extracted from 1863j.*)
- 1863h. The grapevine beetle and rose bug. Country Gentleman 22:65.
- 1863i. The grapevine beetle and rose bug. Cultivator (3rd Series) 11:261.
(*Reprint of 1863h.*)
- 1863j. Insects. Illus. Ann. Register Rural Affairs 9:293-321.
- 1863k. Insects. – The grain *Aphis*, wheat midge, etc. Trans. N. Y. State Agric. Soc. 22(1862):32-38.
- 1863l. The may beetle. Cultivator (3rd Series) 11:245.
- 1863m. Worm on grapevines. Cultivator (3rd Series) 11:245.
- 1864a. *Aphis* on apple-tree buds. Cultivator (3rd Series) 12:211.
(*Reprint of 1864c.*)
- 1864b. A curious insect. Cultivator (3rd Series) 12:274.
(*Reprint of 1864d.*)
- 1864c. The entomologist. *Aphis* on apple-tree buds. Country Gentleman 23:351.
- 1864d. The entomologist. A curious insect. Country Gentleman 24:79.
- 1864e. The entomologist. No. 34. – The buffalo tree-hopper. Country Gentleman 23:386.
- 1864f. The entomologist. No. 35 – The Nebraska bee-killer. Country Gentleman 24:63.
- 1864g. The entomologist. Notes from Dr. Fitch. Country Gentleman 24:47.
- 1864h. The hunter weevil. Country Gentleman 23:384.
- 1864i. The hunter weevil. Cultivator (3rd Series) 12:228.
(*Reprint of 1864h.*)
- 1864j. No. 34. – The buffalo tree-hopper. Cultivator (3rd Series) 12:214-215.
(*Reprint of 1864e.*)
- 1864k. Notes from Dr. Fitch. Cultivator (3rd Series) 12:262.
(*Reprint of 1864g.*)
- 1865a. Address delivered before the annual meeting of the State Agricultural Society, Albany, February 8th, 1865. Trans. N. Y. State Agric. Soc. 24:111-116.
- 1865b. Ants enemies to cut-worms. J. N. Y. State Agric. Soc. 15:79-80.
- 1865c. Entomological correspondence. Cultivator (3rd Series) 13:316-317.
(*Reprint of 1865d.*)
- 1865d. The entomologist. Entomological correspondence. Country Gentleman 26:190-191.
- 1865e. The entomologist. No. 36 – The *Aphis* on hops. Country Gentleman 25:274.
- 1865f. The entomologist. Plant lice – The hop *Aphis*. Country Gentleman 26:82.
- [1865g.] Ninth report on the noxious and other insects of the State of New York. Trans. N. Y. State Agric. Soc. 23(1863):778-823.
(*The publication date printed in the Transactions is 1864. In his manuscript notes and personal diary, Fitch gives the publication date of this report as February, 1865.*)
- 1865h. No. 36 – The *Aphis* on hops. Cultivator (3rd Series) 13:170-171.
(*Reprint of 1865e.*)
- 1865i. Plant lice – the hop *Aphis*. Cultivator (3rd Series) 13:271.
(*Reprint of 1865f.*)
- 1865j. Report of Dr. Fitch on the noxious and other insects, detrimental to agriculture, also an address, delivered before the New York State Agricultural Society. Albany. 56 pp.
(*Reprint of 1865a and 1865g.*)
- 1865k. Sixth, seventh, eighth and ninth reports on the noxious, beneficial and other insects of the State of New York. Made to the State Agricultural Society, pursuant to an annual appropriation for this purpose from the legislature of the state. Albany. 259 pp.
(*Reprint of 1861lh, 1862k, 1863e, and 1865g.*)
- 1865l. Tenth report on the noxious and other insects of the State of New York. Trans. N. Y. State Agric. Soc. 24(1864):433-461.

- 1866a. Ants enemies to cut-worms. Trans. N. Y. State Agric. Soc. 25(1865):133.
(Reprint of 1865b.)
- 1866b. The cotton worm. Cultivator & Country Gentleman 28:257.
- 1866c. Joint-worm in wheat on Long Island. Cultivator & Country Gentleman 28:49.
- 1866d. The naturalist. Insects which injure grain crops. – I. The wheat midge. Cultivator & Country Gentleman 28:306.
(Extracted from 1863j.)
- 1866e. The naturalist. Insects which injure grain crops – II. The hessian fly. Cultivator & Country Gentleman 28:354.
(Extracted from 1863j.)
- 1866f. The sumac gall- *Aphis*. J. N. Y. State Agric. Soc. 16:73.
- 1866g. The vineyard. Beetle on the grape. Cultivator & Country Gentleman 28:142.
- 1867a. Eleventh report on the noxious, beneficial and other insects of the State of New York. Trans. N. Y. State Agric. Soc. 26(1866):487-543.
- 1867b. The entomologist. Currant borers. Cultivator & Country Gentleman 29:386.
- 1867c. Garden insects. Illus. Ann. Register Rural Affairs 13:91-104.
- 1867d. Insects on the potato. Cultivator & Country Gentleman 30:193.
- 1867e. Tenth and eleventh reports on the noxious, beneficial and other insects of the State of New York. Made to the State Agricultural Society, pursuant to an annual appropriation for this purpose from the legislature of the state. Albany. 90 pp.
(Reprint of 1865l and 1867a.)
- 1868a. Garden insects. Illus. Ann. Register Rural Affairs 14:197-212.
- 1868b. Twelfth report on the noxious, beneficial and other insects of the State of New York. Trans. N. Y. State Agric. Soc. 27(1867):889-932.
- 1868c. The vineyard. Excrescences upon grape leaves. Cultivator & Country Gentleman 32:127.
- 1869a. The entomologist. A curious water insect. Cultivator & Country Gentleman 33:154.
- 1869b. The entomologist. The garden millepedes. Cultivator & Country Gentleman 34:381, 402, 421-422.
- 1869c. The entomologist, grain *Aphis* in eastern Tennessee. Cultivator & Country Gentleman 34:35.
- [1871.] Thirteenth report on the noxious, beneficial and other insects of the State of New York. Trans. N. Y. State Agric. Soc. 29(1869):495-566.
(The publication date printed in the Transactions is 1870. In his manuscript notes, Fitch gives the publication date of this report as February, 1871.)
- [1872a.] Fourteenth report on the noxious, beneficial and other insects of the State of New York. Trans. N. Y. State Agric. Soc. 30(1870):355-381.
(The publication date printed in the Transactions is 1871. In his manuscript notes and personal diary, Fitch gives the publication date of this report as February, 1872.)
- 1872b. The naturalist. The Somerville shower of worms. Cultivator & Country Gentleman 37:251.
1873. The tortoise-beetle. Glens Falls Republican, July 22.
- 1875a. It's here – the Colorado potato beetle. Salem Press, July 9 (unpaged).
- 1875b. Noch einmal der Coloradokäfer. Entomol. Nachr., Patbus 1:141-142, 149-150.
(Extracted from 1865g and translated.)
- 1875c. Paris green. Salem Press, July 23 (unpaged).
1878. Ravages of insects on forest and fruit trees – remedy. Cultivator & Country Gentleman 43:471.
(Reprint of 1860o.)
1885. Winter insects of eastern New York, Pages 235-244 in Lintner, J. A. Second report on the injurious and other insects of the State of New York. Albany. 265 pp.
(Reprint of 1847g.)
1893. Catalogue with references and descriptions of the insects collected and arranged for the State Cabinet of Natural History. Rep. N. Y. State Mus. Nat. Hist. 46:383-413.
(Reprint of 1851a, with corrections.)

The Taxonomic Work, Collections, and Types of Dr. Asa Fitch

While researching the injurious insects of New York State, one of Dr. Fitch's first tasks was to identify the species with which he worked. So few American arthropods had been described that he frequently found it necessary to name, describe, and classify interesting species himself. He proposed 13 new generic names and 451 new specific and subspecific names in published works from 1845 to 1872. The names were proposed for various arthropods in 3 classes, 15 orders, and 107 families. Overall, about half of these names are valid. Dr. Fitch made greatest advances with the Homoptera; he proposed 179 nominal species and subspecies, with about 68 percent now considered valid. His worst record seems to have been with the Coleoptera; only 5 of his 43 species and subspecies names (12 percent) are considered valid. In fact, it seems that Dr. Fitch's insect collection contained many misidentified Coleoptera because he was unable to enlist the aid of specialists in this order. He apparently wrote to Dr. LeConte and other coleopterists repeatedly, asking for assistance, but none was forthcoming.¹

Dr. Fitch was conservative about describing new taxa. It was difficult for him to know with certainty if a particular species or subspecies had already been named, described, and classified. His isolation in a rural district hindered his ability to obtain copies of publications from libraries, and pecuniary means did not allow him to import European works extensively. He also found it difficult to obtain many American entomological publications, including those of Thomas Say, one of which he eventually had reprinted.² He frequently had to borrow books from correspondents, and he laboriously copied them by hand. Dr. Fitch was less conservative, however, about naming and describing new varieties, and today these must be considered as proposals of new subspecies.³

Dr. Fitch clarified his concepts of genera, species, and varieties in a letter to Dr. T. W. Harris in 1852. He said that

without the definite criterion of reproduction he would not know what a species is. Without this criterion, workers would continue to split species and create new names as long as they could detect minute differences that could be described or illustrated. To him, species were not merely artificial distinctions; they were natural entities. "What God hath joined together, let not man put asunder." Furthermore, he felt that there were natural genera and family groups, but that a large portion of them were purely artificial — divisions instituted for convenience and to aid the memory. He felt that genera should not be divided merely for convenience no matter how numerous the species, unless some good character could be found — a character clearly perceived in each of the species.⁴

Most of the arthropods that Dr. Fitch described were of agricultural importance in New York State. Thirty-one of his species are still deemed of such significance that they are listed in the 1982 issue of *Common Names of Insects and Related Organisms*.⁵ Many specimens that he described and deposited in his personal collection came from near his home in Salem, New York, but he also had extensive material from elsewhere in North America and, in fact, nearly every corner of the globe. His specimen registers record data for nearly 36,000 specimens from New York State, 13,000 from elsewhere in North America, and several thousand from elsewhere in the world.

Dr. Fitch felt that an insect collection limited by political boundaries would produce a curtailed and imperfect science. ". . . With ships sailing from our principal port to all parts of the world — with our missionaries located in every heathen land — we should be inexcusable for not availing ourselves of these facilities for accumulating samples of the productions of other countries."⁶ His collection contained many specimens from China sent by Reverend M. S. Culbertson of the Presbyterian Board of Foreign Missions. It also contained specimens from many parts of the world

obtained by exchange with entomologists such as Sichel, Signoret, Fairmaire, Murray, and others. There were thousands of specimens from "Tullehassie, West of Arkansas" (= Tullahassee, Wagoner County, Oklahoma) sent by Dr. Fitch's esteemed friend, William Schenck Robertson, a pioneer educator at the Tullahassee Mission in Indian Territory. Dr. Fitch also received many specimens from his daughter Sarah, who moved to Mississippi in 1851 to teach. Occasional specimens were sent from various parts of the Union by such naturalists as T. W. Harris, P. R. Uhler, C. V. Riley, and others.⁷

The New York State Agricultural Society published a notice on Dr. Fitch's collection a few weeks after he was appointed the Society's entomologist:

Dr. Fitch has already the most extensive private Collection of Insects in this country, we presume, and in some departments he has a larger number of species than are to be found in the British Museum. He has lately received from the President of the Entomological Society of France, and some of the members, a magnificent collection of several thousand specimens, embracing all their duplicate species from all parts of the world, containing one or more species in every important genus in the Science. . . . This is most valuable to the Dr., as it will enable him to arrange our New-York Insects without danger of falling into any important error.⁸

On August 23, 1870, C. V. Riley, State Entomologist of Missouri, P. R. Uhler of Baltimore, and J. A. Lintner, then zoological assistant at the New York State Museum of Natural History, successor to the State Cabinet of Natural History, visited Dr. Fitch in Salem and inspected his insect collection. Riley found a rich and valuable collection surpassing anything to be found in the West, including B. D. Walsh's collection.⁹ He reported on the condition of the collection.

At the time of our visit we found a large part of it in poor condition, principally on account of mold which had resulted from the moisture in his "office" and the use of the French "*cartons liégés*" [*sic*] which do not keep out the moisture so well as wooden boxes; but we are glad to learn from those who have lately examined it that, as a whole, the collection is yet in a state of good preservation. It is valuable not only because it contains the types of the insects described by Fitch, but because of the notes which accompany the specimens. Each specimen has a number referring to those notes, which fill 148 books and amount to about fifty-five thousand.¹⁰

Shortly after Dr. Fitch died, his daughter Abbie sought the assistance of P. R. Uhler with the family's attempt to dispose of the insect collection and library. The family wished to profit from a sale so they could use the money to retain the ancestral acres at Fitch's Point in Salem. Uhler

recommended that the State of New York purchase the collection, but the family was still bitter about the way the State had treated Dr. Fitch in the last year of his public service and did not want it to become the owner. The family contacted several institutions that had entomology departments, but no purchaser was found.¹¹

Francis G. Sanborn, a consulting naturalist from Andover, Massachusetts, was invited to visit Salem to appraise the insect collection. Widely known in the eastern United States for his care in the preparation of collections of insects and other objects of natural history, he had been hired to prepare the United States Department of Agriculture's entomological exhibit for the Centennial Exposition in Philadelphia in 1876.¹² In his account of Dr. Fitch's collection, which he described as a "monument of patient industry, unrivalled on this continent at least," he reported that the general collection filled 106 boxes (26 x 19.5 cm) and comprised upwards of 55,000 specimens, nearly all of them in excellent condition. He also found two large cases containing about 120,000 duplicates (mostly Coleoptera), several boxes and trunks containing about 2000 specimens received on exchange, several boxes of galls and other insect productions, a large and valuable entomology library, an extensive manuscript catalog, and a microscope by Nachét.¹³

At the present time, it is not clear exactly how Dr. Fitch's personal insect collection was broken up and dispersed. Parts of the collection were apparently sold to various collectors. The Coccidae and some other Homoptera, along with pertinent notes from the manuscript catalog, were sold to the United States Department of Agriculture. Apparently, part of the collection and some notes were purchased from a dealer in second-hand books and insects in Philadelphia.¹⁴ At one time, the catalog was in the possession of C. V. Riley and the Boston Society of Natural History.¹⁵ The three collection registers that are deposited in the New York State Museum bear Boston Society of Natural History bookplates that are labelled, "From S. H. Scudder, Received Mch. 24, 1893." Over these labels is inscribed, "Presented to the N. Y. State Museum by the Boston Society of Natural History, May 4, 1933, M. B. Cobb, Librarian."

After being appointed Entomologist of the State Agricultural Society in 1854, Dr. Fitch contributed few, if any, insects to the State Cabinet of Natural History.¹⁶ Instead, he immediately began to acquire material for the Agricultural Society's museum. The Society was interested in establishing a museum of practical entomology, displaying injurious insects and the damage they cause. To their knowledge, this was the first public museum established in the United States to accomplish this work, and the agriculturists and naturalists of Europe quickly took note.¹⁷ At home, farmers and other citizens were interested in the progress being made with the museum, which displayed costumes and fabrics from foreign nations, antiquities and relics from this country, old spinning wheels and looms, grains



Agricultural Rooms, State Geological and Agricultural Hall, Albany, New York (From P.A. Chadbourne & W.B. Moore [eds.], *The Public Service of the State of New York*, vol.III [1882]).

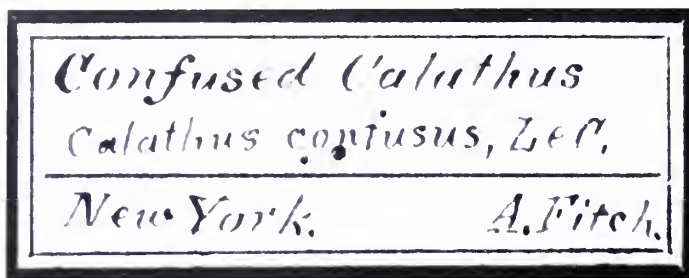
and seeds from around the world, common and uncommon garden vegetables, farm implements from America and abroad, pressed plants, and many other items in addition to injurious insects. On May 19, 1860, the *New York Weekly Tribune* ran a lengthy description of the museum in which the insect collection was thoroughly explored.

The cases along one entire side of the third floor are appropriated to Dr. Asa Fitch's entomological collections, which already are superior to any others in the world in many respects. Time will be when the zealous student of Natural History will be able to study the nature and habits of our noxious and other insects more satisfactorily on this third floor of the State Society's Museum than he could anywhere else, and time will also be when our farmers will awake to the fact that one of their greatest benefactors has lived out his quiet life, and perhaps laid him down to die in an obscure rural district, with no monument to keep green his memory except these splendid collections which he freely gave years of his life to gather from our fields and forests.

The Fitch collections, when arranged this Fall, will be divided so that the various insects in all their stages – egg, larva, pupa, and moth – will be placed in drawers beneath the cases, while the more roomy space of the latter will be devoted to the display of specimens which illustrate the ravages of the insects. There are now but few specimens set up in the cases, but quite enough to show the ultimate value of the collection. Thus we have a piece of basswood the substance of which has been mined out by white ants. Alongside it is a glass-covered box which contains specimens of our dread foe the wheat-midge, its larva, a male

fly, and kernels of wheat shrunken and ruined. Another of these little boxes shows us the Hessian-fly, its larva, its flax-seed-like eggs, and a wheat straw broken open to show the "flax seeds" within. Here we have a twig of mountain-ash covered with scale insects; here, a twig of poplar, the eggs of the "executioner tree bug," strung along in two unbroken parallel and contiguous lines, like a string of little sandal-wood beads or a daintily-braided strand of maiden's hair; here we have a limb of black-oak cut off by the oak-pruner; here a piece of red cedar – which every one has believed insect proof – utterly destroyed by the stump wasp; while, like the mysterious foot prints in the red sand-stone and chalk, on the bit of pine bark, are to be seen the finger-like tracks of the "pine bark-beetle," starting from a central pit, or hole, and spreading – always four at one side and two at the other – like the fingers of a hand. In a bottle of spirits here we have the larvae of the "hickory moth," the largest known, which is so frightfully ugly – what with its long horns and bamboo-like joints – that we cannot blame the plantation darkies for calling it the "horned devil." Here is a hickory ax-helve, sound as a mit when first made, but since then completely riddled at one end by some hickory beetle, probably (says the label) by the *apate basillaris* – which of course will be perfectly intelligible to every one of our readers. In this case, near the stairway, we see a great section of apple wood – five feet in circumference, one foot ten in diameter – which has been literally honey combed by the borer. Not to occupy space with further enumerations, we will merely say that by this time next year farmers passing through Albany will be able to examine in the collection several thousand specimens of insects and their ravages.¹⁸

Dr. Fitch worked from time to time over the years to complete the collection of injurious insects of New York. He sometimes drew specimens from his personal collection, but he preferred to have fresh specimens, which were less moldy. In August of 1871 he made a major effort to complete the collection. He worked daytime cleaning specimens, checking identifications, and placing the insects in the cases. In the evenings, he printed labels. On October 7, he finished the collection and was free to draw the last of his annual salary. Altogether, he contributed 1504 specimens to the museum. Unfortunately, as he worked, dermestid beetles attacked the specimens, and watch crystals full of camphor failed to repel the pests.¹⁹ In 1888, the New York State Legislature recognized the value of the collection and appropriated funds for its preservation.²⁰ A small part of that collection still exists, at the New York State Museum.



A printed label from an insect specimen prepared by Dr. Fitch for the New York State Agricultural Society's museum.

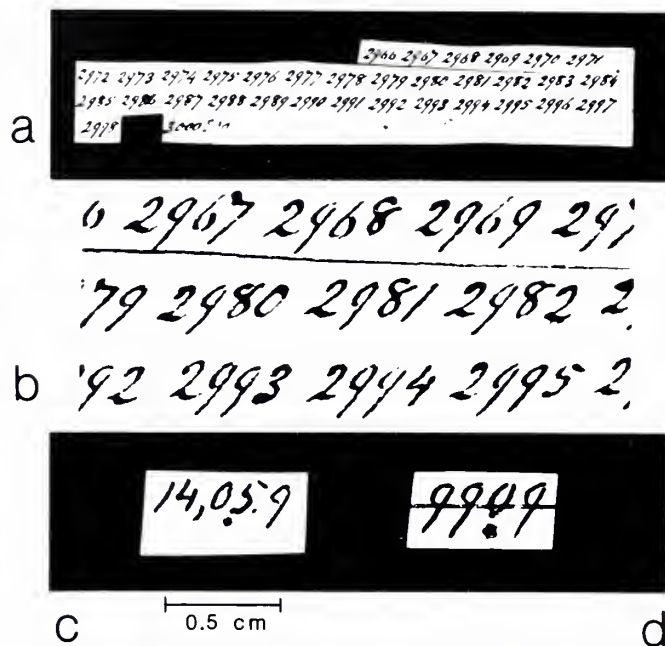
Catalog of Taxonomic Names and Type Specimens

In the following catalog, all available arthropod names Dr. Fitch proposed in print are listed. Species and subspecies names are given in their original combinations with generic names; original spellings are preserved, even when incorrect. The names are arranged alphabetically by species or subspecies within each family. Families are arranged by phylogenetic classification. Variety names consisting of a single letter are not available and, therefore, not listed.²¹ In all other cases, names proposed as varieties are treated as subspecies.²² After each name, the date on which it was first proposed is given, followed by one or two letters corresponding with the appropriate publications listed in Appendix A and the page number on which it first appeared.

A name recognized as a valid recent combination, senior synonym, replacement name, or corrected spelling for a name proposed by Dr. Fitch is listed on the second line of each entry. In most cases these names were located in modern catalogs and revisions.

Dr. Fitch never designated a type specimen. Data concerning the type series (the specimens on which Dr. Fitch based the species or subspecies) are listed under "Original Specimens." The closest available approximation to a type series for a species or subspecies name proposed by Dr. Fitch consists of those specimens that can be proven, through a perusal of his registers and catalog, to have been in his collection before or during the year in which the name was made available. Specimens that Dr. Fitch considered variants or aberrants are not listed because they are not part of the type series.²³

Dr. Fitch labelled nearly all of his specimens with individual numbers, recording them in four registers, along with collecting dates, localities, and other pertinent information. Label numbers written in black ink on white paper are recorded in one register of specimens collected in New York State. Label numbers written in black ink on white paper and crossed with one or two red lines are recorded in a second register of specimens from New York State. One red line designates that the label number is less than 10,000, and two red lines designates a number to which 10,000 should be added. Label numbers written in red ink on white paper are listed in a third register, which records



Typical labels from Dr. Fitch's personal insect collection: a) uncut strip of labels; b) close-up view of a section of a; c) New York insect label 14,059, black ink on white paper; d) New York insect label *9909, black ink on white paper, crossed with one red line. Labels c) and d) same scale.

specimens from elsewhere in North America. These three registers are deposited in the New York State Museum. In the following catalog, label numbers that are preceded by one or two asterisks correspond with specimen labels that are crossed with one or two red lines, respectively. A fourth register, deposited in the Museum of Science, successor to the Boston Society of Natural History, lists specimens from elsewhere in the world. The corresponding labels are written in black ink on colored papers.

In his manuscript catalog, Dr. Fitch kept sheets of notes (10 x 15 cm) on every arthropod species of which he was aware. On them he recorded brief diagnoses of the species followed by fuller descriptions and remarks. If he had a specimen of any given species, he recorded its number along with collection data on the appropriate sheet. Numbers underscored once or twice correspond with label numbers for New York specimens that were crossed with one or two red lines, respectively. Numbers that are over-scored correspond with label numbers for specimens from outside New York State that exceed 10,000. Some of the notes include unpublished illustrations. Most of the catalog is deposited in the New York State Museum, but the sections on Psyllidae and Coccidae are in the Smithsonian Institution Archives, the section on Aphididae is with the United States National Museum aphid collection in Beltsville, and the Section on Collembola is in the library of the Museum of Science in Boston.

In his Homoptera catalog (1851a), Dr. Fitch described 6 new genera, 85 new species, and 5 subspecies. Specimens

of many taxa described in that publication are now in the New York State Museum, although the Psyllidae, many of the Aphididae, and a few specimens from other families were destroyed by museum pests. The specimens were taken from his personal collection and renumbered. They bear printed labels with numbers ranging from 609 to 874, which correspond with specimen numbers given in his published catalog but bear no relation to his manuscript catalog or specimen registers.²⁴

Specimens that are or might be part of an original type series are listed in this catalog under "Extant Specimens." These include specimens that bear printed labels corresponding with the specimen numbers given in the Homoptera catalog (1851a), specimens with labels written by Dr. Fitch that can be shown to have been in his collection on or before the year in which he proposed the specific or subspecific name for them in print, and specimens without Fitch labels, but bearing labels written by subsequent workers that indicate them to be Fitch types. A slash (/) separates material taken from different labels on a given

specimen. Extant specimens have been found in the New York State Museum (NYSM), the United States National Museum, including the Homoptera Collection and the National Parasite Collection at the Beltsville Agricultural Research Center (USNM), the main collection of the Museum of Comparative Zoology at Harvard University (MCZ), the T. W. Harris Collection at the MCZ (MCZH), and the Museum National d'Histoire Naturelle in Paris (MNHN). It is, of course, possible that specimens are present in other collections that have not been investigated.

For many species and subspecies, lectotypes should be designated from the lists of extant specimens, if designations have not been made already. W. D. Funkhouser designated lectotypes for the Membracidae described in the Homoptera catalog.²⁵ Keirans and Barnes designated lectotypes for the ticks described by Fitch.²⁶

Please note that data are presented in this catalog just as they were found in the Fitch notes or on specimen labels. A listing for specimens from Tullehassie, AR, must be interpreted to mean that the specimens came from Tullahassee, OK.

Generic Names Proposed by Dr. Fitch

Order HEMIPTERA

Family MEMBRACIDAE

1. **Carynota** Fitch, 1851a:48.
Carynota Fitch.
Type-species:*Membracis mera* Say, by subsequent designation.
2. **Cyrtoisa** Fitch, 1851a:49.
Cyrtolobus Goding (replacement name for *Cyrtosia* Fitch (correct spelling for *Cyrtoisa* Fitch), preoccupied by *Cyrtosia* Perris).
Type-species:*Cyrtosia fenestrata* Fitch, by subsequent designation.
3. **Telamona** Fitch, 1851a:50.
Telamona Fitch.
Type-species:*Membracis ampelopsidis* Harris, by subsequent designation.

Family CICADELLIDAE

4. **Empoa** Fitch, 1851a:63.
Empoa Fitch.
Type-species:*Empoa querci* Fitch, by subsequent designation.
5. **Erythroneura** Fitch, 1851a:62.
Erythroneura Fitch.
Type-species:*Erythroneura tricincta* Fitch, by subsequent designation.
6. **Helochara** Fitch, 1851a:56.
Helochara Fitch.
Type-species:*Helochara communis* Fitch, by monotypy.

Family ISSIDAE

7. **Naso** Fitch, 1857m:396.
Fitchiella Van Duzee (replacement name for *Naso* Fitch, preoccupied by *Naso* Lacépède).
Type-species:*Naso robertsonii* Fitch, by monotypy.

Order NEUROPTERA

Family CONIOPTERYGIDAE

8. **Aleurnia** Fitch, 1855n:801.
Malacomyza Wesmael.
Type-species:*Aleurnia westwoodii* Fitch, by monotypy.

Family HEMEROBIIDAE

9. **Meleoma** Fitch, 1855n:786.
Meleoma Fitch.
Type-species:*Meleoma signoretii*, by monotypy.

Order LEPIDOPTERA

Family NOTODONTIDAE

10. **Eumetopona** Fitch, 1856l:467.
Datana Walker.
Type-species:*Phalaena ministra* Drury, by monotypy.

Family LASIOCAMPIDAE

11. **Planosa** Fitch, 1856l:494.
Tolype Hübner.
Type-species:*Planosa laricis* Fitch, by subsequent designation.

Order HYMENOPTERA

Family CYNIPIDAE

12. **Biarhiza** Fitch, 1859d:781.
Biorhiza Westwood.
Note: *Biarhiza* Fitch is an unjustified emendation of *Biorhiza* Westwood.
13. **Philonix** Fitch, 1859d:783.
Philonix Fitch.
Type-species:*Philonix fulvicollis* Fitch, by subsequent designation.

Specific and Subspecific Names Proposed by Dr. Fitch

Class CRUSTACEA

Order ISOPODA

Family ONISCIDAE

1. **Porcellio glaber confluentus** Fitch, 1855n:823.
Cylisticus convexus (Degeer).
2. **Porcellio limatus dorsalis** Fitch, 1855n:825.
Oniscus asellus Linnaeus.
3. **Porcellio glaber** Fitch, 1855n:823.
Cylisticus convexus (Degeer).
Original Specimens:13,986-987, Salem, NY, 12. xi. 1853, under a board at the east end of the woodshed.
4. **Porcellio immaculatus** Fitch, 1855n:824.
Porcellionides pruinosis (Brandt).
Original Specimens:2860, Tullehassie, AR, 1851, from Wm. S. Robertson, young; 5988, Tullehassie, AR, 1852, from Wm. S. Robertson; 8597-99, Mercer Co., IL, 6. x. 1854, dry bed of Duck Creek; Salem, NY, i. vi. 1855, under sticks and boards in the yard.
5. **Porcellio limatus lateralis** Fitch, 1855n:825.
Oniscus asellus Linnaeus.
6. **Porcellio limatus** Fitch, 1855n:824.
Oniscus asellus Linnaeus.
Original Specimens:13,984-985, Salem, NY, 12. xi. 1853, under wood in the wood yard.
7. **Porcellio limatus limbalis** Fitch, 1855n:825.
Oniscus asellus Linnaeus.
8. **Porcellio limatus marginatus** Fitch, 1855n:825.
Oniscus asellus Linnaeus.
9. **Porcellio mixtus** Fitch, 1855n:824.
Porcellio spinicornis Say.
Original Specimens:Salem, NY, 6. xi. 1853, under logs in chip yard, one specimen; Salem, NY, 30. v. 1855, under logs back of woodshed, three specimens.
10. **Porcellio limatus multiguttatus** Fitch, 1855n:825.
Oniscus asellus Linnaeus.
11. **Porcellio mixtus variegatus** Fitch, 1855n:824.
Porcellio spinicornis Say.
12. **Porcellio vittatus** Fitch, 1855n:824.
Tracheoniscus rathkei (Brandt).
Original Specimens:6342-43, Stillwater, NY, 4. iv. 1836, under side of damp cellar door; 911-912, 15. ix. 1836, near Jesse Seymour's; 1132, Stillwater, NY, 14. iv. 1837, under stones north of Hodgman's woods; Salem, NY, 6-7. xi. 1853, numerous specimens taken under boards and logs about the woodshed; Salem, NY, 30. v. 1855, about the roots of peach trees, in front yard.

Class INSECTA

Order COLLEMBOLA

Family PODURIDAE

13. **Podura nivicola** Fitch, 1847g:283.
Hypogastrura nivicola (Fitch).
Original Specimens:12,223-227, Salem, NY, 5. i. 1847, on snow and in rivulets, Jarvis Martin's woods; 12,228-230, Salem, NY, 7. i. 1847, on pools in Mrs. Fitch's woods.

Family SMINTHURIDAE

14. **Symnthurus hortensis apicalis** Fitch, 1863e:671.
Bourletiella hortensis (Fitch).
15. **Symnthurus arvalis** Fitch, 1863e:673.
Bourletiella arvalis (Fitch).
Original Specimens:Salem, NY, 24. v. 1854, on a leaf of a young apple tree; 26. vi. 1862, in myriads on clover.
16. **Symnthurus hortensis basalis** Fitch, 1863e:671.
Bourletiella hortensis (Fitch).
17. **Symnthurus hortensis dorsalis** Fitch, 1863e:671.
Bourletiella hortensis (Fitch).
18. **Symnthurus elegans** Fitch, 1863e:674.
Sminthurinus elegans (Fitch).
Original Specimens:3795, 6. v. 1852, four specimens and numerous others found in a jar of diseased wheat straw from Virginia, sent to me by Dr. Harris. Possibly they may have come from the New York dirt put into the jar, and not from the Virginia straw.
19. **Symnthurus hortensis** Fitch 1863e:668.
Bourletiella hortensis (Fitch).
Original Specimens:12,341, Salem, NY, 3. vi. 1847, Jarvis Martin's wheat field; Salem, NY, 24. v. 1854, on apple trees, beat from the leaves; Salem, NY, 15-25. v. 1861, abundant on young wheat and rye; 26. vi. 1862, common on clover.

20. *Symnthurus hortensis juvenilis* Fitch, 1863e:671.
Bourletiella hortensis (Fitch).
21. *Symnthurus hortensis maturus* Fitch, 1863e:671.
Bourletiella hortensis (Fitch).
22. *Symnthurus novaeboracensis* Fitch, 1863e:674.
? *Dicyrtoma* sp.
Original Specimens:Salem, NY, 11. xi. 1853, found several specimens under a board, at the bars, west base of Battle Hill.
23. *Symnthurus signifer* Fitch, 1863e:675.
Original Specimens:3793, four specimens, found in a jar of diseased wheat straw from Virginia, sent me by Dr. Harris. They may possibly have come from the damp dirt put into the jar, and not from the straw.

Order PLECOPTERA

Family TAENIOPTERYGIDAE

24. *Nemoura nivalis* Fitch, 1847g:279.
Taeniopteryx nivalis (Fitch).
Original Specimens:5107, Fort Miller, NY, 1832; 1538, Stillwater, NY, 4. v. 1837, Wilbur's basin, on leaves; 3384, Salem, NY, 7. vi. 1837, in woods on the wing; 3418, Stillwater, NY, 9. vi. 1837, near grandmother's; 7700-06, Salem, NY, iii. 1844, on melting snow; 10,077-078, 27. iii. 1845, on willows, north bank of Black Creek; 10,067-070, 5. iv. 1845, in meadow, on snow; *635, Salem, NY, 15. iv. 1845, on big hill, on the wing; *737, Salem, NY, 26. iv. 1845, flying, Jarvis Martin's woods; 12,404-433, 12,466, Salem, NY, Spring, 1847, various situations.

Family CAPNIIDAE

25. *Perla nivicola* Fitch, 1847g:278.
Allocapnia nivicola (Fitch).
Original Specimens:7710-13, Salem, NY, iii. 1844, on melting snow; 10,057-060, Salem, NY, 7. iv. 1845, on snow, Jarvis Martin's woods; *4223-47, Salem, NY, 2. ii. 1847, on melting snow along the outlet of McDougall's Lake; *4269-82, Salem, NY, 4. iii. 1847, on melting snow, woodlot, by McDougall's Lake.
Extant Specimens: *4224/ *P. nivicola*, A. Fitch/Hagen/Type, 10114 (MCZ).

Order ORTHOPTERA

Family TETTIGONIIDAE

26. *Acanthodis macrocerus* Fitch, 1857m:489.
Original Specimens:Acapulco, Mexico or Martinique, 1854.

Family OECANTHIDAE

27. *Oecanthus niveus augustipennis* Fitch, 1857m:413.
Oecanthus niveus Degeer.

28. *Oecanthus niveus discoloratus* Fitch, 1857m:413.
Oecanthus niveus discoloratus Fitch.
Original Specimens:5937, Tullehassie, AR, 1852, from Wm. S. Robertson.
29. *Oecanthus niveus fuscipes* Fitch, 1857m:413.
Oecanthus niveus fuscipes Fitch.
Original Specimens:1851, New Brunswick, NJ, 23. ix. 1851, upon walnut and oak leaves.

Order PSOCOPTERA

Family PSOCIDAE

30. *Psocus aceris* Fitch, 1862g:162.
Original Specimens: Salem, NY, 29. vii. 1854, on maple and shad bark, from J. McDonald.
31. *Psocus tritici* Fitch, 1847f:151.
Original Specimens:11,818, 23. vii. 1846, on wheat stalks; 12,019-021, Salem, NY, 23. ix. 1846, on Mrs. Fitch's barn floor.

Order HEMIPTERA

Family CICADIDAE

32. *Cicada robertsonii* Fitch, 1855n:745.
Tibicen resh (Haldeman).
Original Specimens:1113, Tullehassie, west of AR, 1850, taken by Wm. S. Robertson.
33. *Cicada superba* Fitch, 1855n:745.
Tibicen superbus (Fitch).
Original Specimens:3015, Tullehassie, west of AR, summer, 1851, from Wm. S. Robertson.

Family MEMBRACIDAE

34. *Smilia auriculata* Fitch, 1851a:49.
Archasia galeata (Fabricius).
Original Specimens:5101, Stillwater, NY, 15. vii. 1847, on oak bushes.
Extant Specimens:676/Male/Type (NYSM).
Note: There are two specimens from Fitch's collection in the USNM. They are labelled 10,188, and 875 in Fitch's handwriting in red ink. The latter is overscored, and it is also labelled "Fitch's Type." Neither of these specimens can be considered part of Fitch's type series because, according to his manuscript notes, both were obtained from Wm. S. Robertson in 1855, four years after the original description was published.
35. *Ceresa brevicornis* Fitch, 1857m:451.
Stictocephala brevicornis Fitch.
Original Specimens: 1875, New Brunswick, NJ, 23. ix. 1851, on walnut bushes.
Extant Specimens:Fitch's Type/Fitch's Collection/ 1875/Type No. 599/USNM/ *Ceresa brevicornis* (Type) Fitch (USNM).

36. **Uroxiphus caryae** Fitch, 1851a:52.
Microcentrus caryae (Fitch).
 Original Specimens: *3921, Salem, NY, 11. viii. 1846, on walnut, Titus's hill; *3992-97, Greenwich, NY, 24. viii. 1846, on shag-bark hickory, near P. C. Dunlap's; *6073-76, Salem, NY, 19. viii. 1847, on shag-bark hickory, Titus's hill; *6276-77, Salem, NY, 4. ix. 1847, on walnut, northwest corner of Mill Lot; *6646-47, Greenwich, NY, 20. ix. 1847, on pig-walnut, along Cossayuna Lake; 13,273, Stillwater, NY, vii. 1848, on walnut bushes; 1879, New Brunswick, NJ, 23. ix. 1851, on walnut leaves.
 Extant Specimens: *3992/ *Uroxiphus caryae* Fitch/257 (MCZH); *3997 (MCZH); 700/Male. /Type (NYSM); 701/Female (NYSM).
37. **Smilia castaneae** Fitch, 1851a:49.
Alymnia castaneae (Fitch).
 Original Specimens:3847, Stillwater, NY, 6. vii. 1837, on leaves, near grandmother's; 3955, 3957-58, Stillwater, NY, 8. vii. 1837, near grandmother's; 4179-80, Stillwater, NY, 12. vii. 1837, meadow east of grandmother's; 11,746-749, 11,754-755, Stillwater, NY, 16. vii. 1846, on oaks in big swamp; 11,765, 11,794, 11,796, Stillwater, NY, on chestnut bushes, west of grandmother's; *3597-98, Salem, NY, 24. vii. 1846, on chestnut tree, Jarvis Martin's woods; *3914-15, Salem, NY, 11. viii. 1846, on chestnut, Sidney Martin's back pasture; *4978, Salem, NY, forepart of July, 1847; *5180, Stillwater, NY, 15. vii. 1847, on chestnut bushes; *6924, Long Island, NY, 1847, from Wm. S. Robertson.
 Extant Specimens:Fitch's Type/Fitch's Collection/ *4978/ Type No. 601, U. S. N. M. / *S. castaneae*, Fh. (USNM); 669/ Male/Type (NYSM); 670/Female (NYSM); 671/Var. a (NYSM).
38. **Telemona concava** Fitch, 1851a:50.
Telemona concava Fitch.
 Original Specimens:5419, Stillwater, NY, 1834, a female.
 Extant Specimens:686/Female/Type (NYSM).
 Note: A specimen in the USNM collection bears Fitch's label 2133, and it is also labelled "Fitch's Type, Fitch's collection, No. 608, U. S. N. M., *Telemona concava* Fh." Fitch's manuscript notes and specimen registers show that he did not have a specimen of *T. concava* numbered 2133, so this specimen cannot be a type.
39. **Telemona coryli** Fitch, 1851a:51.
Telemona tristis Fitch.
 Original Specimens: *3072, Salem, NY, 24. vi. 1846, on hazel-nut bushes on the big hill.
 Extant Specimens:690/Female/Type (NYSM).
40. **Thelia crataegi** Fitch, 1851a:52.
Glossonotus crataegi (Fitch).
 Original Specimens: *3647-48, Salem, NY, 27. vii. 1846, on a thorn bush near the Batten Kill, upper corner of Esq. Martin's meadow; *5665-66, Salem, NY, 8. viii. 1847, on thorn bush, Esq. Martin's field.
 Extant Specimens:697/Type (NYSM); Female (NYSM).
 Note: A specimen in the USNM collection bears Fitch's label **4416, and it is also labelled "Fitch's Type, Fitch's Collection, Type No. 602, U. S. N. M., *Thelia* Amy. + Ser., *crataegi* Fitch, New York." According to Fitch's specimen registers, this specimen was collected in 1854, and, therefore, it is not part of the original type series.
41. **Tragopa dorsalis** Fitch, 1851a:52.
Microtalis dorsalis (Fitch).
 Original Specimens: *3657-59, Salem, NY, 27. vii. 1846, on *Cornus paniculata* in Esq. Martin's meadow; *3870, Salem, NY, 6. viii. 1846, on grape vines, in the meadow; *5244, Salem, NY, 21. vii. 1847, on sumach, in Sidney Martin's meadow; *7929-31, Salem, NY, 25. vii. 1848, on grape vine, Esq. Martin's meadow; **132-142, Salem, NY, 25. vii. 1851, on grape vine, in the meadow; **116, Salem, NY, 25. vii. 1851, on sumach, in the meadow; 3141, Windsor, MA, vii. 1851, from T. B. Ashton; *478, Salem, NY, x. 1851, on chestnut, on Titus's hill.
 Extant Specimens: **134/ *Tragopa dorsalis* Fitch/256 (MCZH); **137/256A (MCZH); 698/Male/Type (NYSM); 699/Female (NYSM).
42. **Telamona fagi** Fitch, 1851a:51.
Heliria fagi (Fitch).
 Original Specimens: **3340, Salem, NY, 13. vii. 1846, on beech tree, by big hill, male.
 Extant Specimens:687/Male/Type (NYSM).
 Note: A specimen in the USNM collection bears Fitch's label *9844, and it is also labelled "Fitch's Type, Fitch's Collection, Type No. 609, U. S. N. M., *T. fagi*, Fh." Fitch's manuscript notes and specimen registers show that he did not have a specimen of *T. fagi* numbered *9844, so this specimen cannot be a type.
43. **Telemona fasciata** Fitch, 1851a:50.
Telemona unicolor Fitch.
 Original Specimens: *3923, Salem, NY, 11. viii. 1846, on walnut bushes, Titus's hill.
 Extant Specimens:685/Female/Type (NYSM).
 Note: A specimen in the USNM collection bears Fitch's label 14,496, and it is also labelled "Fitch's Type, Fitch's Collection, Type No. 605, U. S. N. M., *T. fasciata*, Fh." According to Fitch's specimen registers, this specimen was collected in 1856, and, therefore, it is not part of the original type series.
44. **Cyrtoisa fenestrata** Fitch, 1851a:49.
Cyrtolobus fenestratus (Fitch).
 Original Specimens:132-139, East Greenwich, R. I., viii. 1846, from Pliny F. Martin; *6922, *6926-27, Long Island, NY, 1847, from Wm. S. Robertson; *5365, Salem, NY, 23. vii. 1847, on white oak, dugway woods; *6171, Salem, NY, 21. viii. 1847, on white pine, near McDougall's Lake; *6234, Salem, NY, 4. ix. 1847, on white oak, northwest corner of mill lot.
 Extant Specimens:Fitch's Type/*6926 Fitch's Collection/ Female/Type No. 599, U.S.N.M./ *C. fenestrata*, Fh. (USNM); *6927/*Cyrtoisa fenestrata* Fitch/237 (MCZH); 678 Male/Type (NYSM); Female (NYSM).
45. **Smilia vittata guttata** Fitch, 1851a:49.
Smilia camelus (Fabricius).
 Original Specimens: *3122-28, Salem, NY, 26. vi. 1846, on bushes of red? oak in Jarvis Martin's woods; *3306-22, Salem, NY, 11. vii. 1846, on black oak bushes (*Q. tinctoria*), southeast corner of Mrs. Fitch's woods; 11,753, Stillwater, NY, 16. vii. 1846, on oaks in the big swamp; *4633, Salem, NY, 28. vi. 1847, on oaks, Jarvis Martin's woods.
 Extant Specimens:675/Subsp. *guattata* (NYSM).

46. *Enchophyllum ensatum intermedia* Fitch, 1857m:465.
47. *Telemona unicolor irrorata* Fitch, 1857m:450.
Telemona unicolor Fitch.
48. *Smilia querci* Fitch, 1851a:49.
Atymna querci (Fitch).
Original Specimens: *4530-31, Salem, NY, 26. vi. 1847, on oaks, dugway hill; *4834, Salem, NY, 5. vii. 1847, on white oak in Esq. Martin's pasture. *6931-32, Long Island, NY, 1847, from Wm. S. Robertson.
Extant Specimens: *6931/Fitch's Type/Fitch's Collection/Type No. 600, U.S. N.M./*S. querci*, Fh. (USNM); 672/Type (NYSM); 673/Var. a (NYSM); Male (NYSM).
49. *Telemona querci* Fitch, 1851a:51.
Telemona monticola (Fabricius).
Original Specimens: *3033, Salem, NY, 24. vi. 1846, on the big hill, on white oak trees; *3108-09, Salem, NY, 26. vi. 1846, beat from oak bushes in Jarvis Martin's woods; *3136, Greenwich, NY, 29. vi. 1846, border of woods north of Peter Dunlap's, on an oak bush; *3302, Salem, NY, 11. vii. 1846, on young branches of black oak (*Quercus tinctoria*), south-east corner of Mrs. Fitch's woods; 11,783, Stillwater, NY, 16. vii. 1846, on oaks, west of grandmother's; *3876, Salem, NY, 11. viii. 1846, on white oaks, Titus's hill; 143, East Greenwich, RI, viii. 1846, from Pliny F. Martin; *4681, Salem, NY, 28. vi. 1847, on thorn, Jarvis Martin's woods; *4631-32, Salem, NY, 28. vi. 1847, on oaks, Jarvis Martin's woods; *6014, Salem, NY, 19. viii. 1847, on white oaks, Titus's hill; *6918, Long Island, NY, 1847, from Wm. S. Robertson.
Extant Specimens: *3109/Fitch's Collection/*T. querci*, Fh./Type No. 603, U.S.N.M./F.W.G., *Telemona querci* Fh. (USNM); 691/Male/Type (NYSM); 692/Female (NYSM).
50. *Telemona reclinata* Fitch, 1851a:51.
Telemona reclinata Fitch.
Original Specimens: 11,769, Stillwater, NY, 16. vii. 1846, west of grandmother's; 11,793, Stillwater, NY, 16. vii. 1846, on chestnut bushes west of grandmother's; *3695, Salem, NY, 27. vii. 1846, on black oak in Esq. Martin's pasture; *3787, Salem, NY, 29. vii. 1846, on white oak on dugway hill; 12,727, Canajoharie, NY, from Wm. S. Robertson.
Extant Specimens: 693/Type (NYSM).
Note: A specimen in the USNM Collection bears Fitch's label **5979, and it is also labelled "Fitch's Type, Fitch's Collection, *T. reclinata*, Fh., Type No. 606, U. S. N. M." Fitch's manuscript notes and specimen registers show that he did not have a specimen of *T. reclinata* numbered **5979, so this specimen cannot be a type.
51. *Ceresa taurina* Fitch, 1857m:335.
Stictocephala taurina (Fitch).
Original Specimens: *3573, *3575, Salem, NY, 24. vii. 1846, on beech trees, Jarvis Martin's woods; *3668, Salem, NY, 27. vii. 1846, on maple, by Batten Kill, Esq. Martin's farm; 13,275, 13,291, Stillwater, NY, vii. 1848, on walnut and on oak bushes; 10,179, Salem, NY, 15. viii. 1851, in front yard; 13,435, Whitestown, NY, 16. ix. 1851, on *Aster* and *Solidago* flowers.
Extant Specimens: Fitch's Type/Fitch's Collection/*3668/*Ceresa taurina*, H. Cat./Type No. 596, U.S.N.M./Type (Fitch) (USNM).
52. *Entilia sinuata torva* Fitch, 1851a:47.
Entyilia carinata Forster.
Original Specimens: 2302, Salem, NY, 1831; 3848, Stillwater, NY, 6. vii. 1837, on leaves, near grandmother's; 8565, Salem, NY, 23. vi. 1844, on a Canada thistle, protected by ants; *8556-58, Salem, NY, 20. v. 1846, on trees, north-west corner of mill lot; *2680-81, Salem, NY, 20. v. 1846, on pine trees, northwest corner of mill lot; *3987, Greenwich, NY, 24. viii. 1846, on chestnut trees, near P. C. Dunlap's; *4152, Salem, NY, 11. xi. 1846, on pine trees, dugway woods; *6663, Greenwich, NY, 20. ix. 1847, on shrubs along Cossayuna Lake; *7353, Salem, NY, 12. v. 1848, on pines, Jarvis Martin's woods; 12,592, Salem, NY, 17. ix. 1850, on pines, northwest corner of mill lot.
Extant Specimens: 647/Subsp. *torva* (NYSM).
53. *Telemona tristis* Fitch, 1851a:51.
Telemona tristis Fitch.
Original Specimens: *3907, Salem, NY, 11. viii. 1846, on *Ostrya*, on Titus's hill; *5547, Salem, NY, 29. vii. 1847, on *Cornus paniculata*, north side of Black Creek, *6372, Salem, NY, 10. ix. 1847, on hazelnut bushes, Esq. Martin's meadow.
Extant Specimens: Female (NYSM); 689/Type (NYSM).
Note: A specimen in the USNM collection bears Fitch's label **102, and it is also labelled "Fitch's Type, Fitch's Collection, *T. tristis*, Fh., Type No. 607, U. S. N. M., *T. coryli* Fitch." Fitch's manuscript notes and specimen registers show that he did not have a specimen of *T. tristis* numbered **102, so this specimen cannot be a type.
54. *Telemona unicolor* Fitch, 1851a:50.
Telemona unicolor Fitch.
Original Specimens: 5420, Stillwater, NY, 1834; 13,274, Stillwater, NY, vii. 1848, on walnut bushes, west of grandmother's; 1878, New Brunswick, NJ, 23. ix. 1851, on walnut bushes.
Extant Specimens: 684/Female/Type (NYSM).
Note: A specimen in the USNM collection bears Fitch's label **1800, and it is also labelled "Fitch's Type, Fitch's Collection, *T. unicolor*, Fh., Type No. 604, U. S. N. M." According to Fitch's specimen registers, this specimen was collected in 1852, and, therefore, it is not part of the original type series.

Family CICADELLIDAE

55. *Athysanus abietis* Fitch, 1851a:60.
Oncopsis variabilis (Fitch).
Original Specimens: *2724, Salem, NY, 20. v. 1846, on birch, northwest corner of mill lot; 475-477, Winhall, VT, 17. vi. 1847, on spruce and fir shrubs, near summit of Green Mountains; *4622, Salem, NY, 28. vi. 1847, on birch, Jarvis Martin's woods; *9894, Salem, NY, 9. vi. 1851, on grass, west border of Jarvis Martin's woods.
Extant Specimens: 793 (NYSM); Female (NYSM).
56. *Erythroneura affinis* Fitch, 1851a:63.
Erythroneura affinis Fitch.
Note: According to McCabe and Johnson (*Bull. N. Y. State Museum*, 434, 1980), the type (No. 822) has been destroyed.

57. **Idiocerus alternatus** Fitch, 1851a:59.

Idiocerus alternatus Fitch.

Original Specimens: 796-97, Salem, NY, 28. iv. 1845, on willow flowers by Black Creek; *5603, Salem, NY, 29. vii. 1847, on grape vine, meadow north of Black Creek; *7289-93, Salem, NY, 12. v. 1848, on black currant bushes, in meadow; *7457, Jackson, NY, 25. v. 1848, on willow, near red bridge; *8437, Salem, NY, 25. iv. 1851, on a pool of water, in the meadow; *8641, *8646, Salem, NY, 7. v. 1851, on willows, in the meadow; *8665-66, Salem, NY, 7. v. 1851, on weeds, in the meadow; *8827-32, Salem, NY, 10. v. 1851, on willows, Esq. Martin's meadow; *8994-95, Salem, NY, 12. v. 1851, on willows, Harvey's meadow; *9074-75, Salem, NY, 19. v. 1851, on willows, in my meadow; *9955, Salem, NY, 12. vii. 1851, on willows, in my meadow.

Extant Specimens: Fitch's Type/Fitch's Collection (USNM); *8665/ *Idiocerus alternatus* Fitch/175 (MCZH); *8828/175A (MCZH); 9075/175B (MCZH); 779/Male (NYSM); 780/Female (NYSM).

58. **Penthimia americana** Fitch, 1851a:57.

Penthimia americana Fitch.

Original Specimens: *7461-62, Jackson, NY, 25. v. 1848, on maples, near the red bridge; 1089, Tullehassie, AR, 1850, from Wm. S. Robertson.

Extant Specimens: Fitch's Type/Fitch's Collection/ Arkansas, W. S. Robertson (USNM); 760/Male (NYSM); 761/Female (NYSM).

Note: A specimen in the USNM collection bears Fitch's label *498 in red ink, and it is also labelled "Fitch Type, Fitch Collection, *Penthimia americana* Fitch, New York." According to Fitch's specimen registers, this specimen was collected in "Tullehassie, Ark." in 1855, and, therefore, it is not part of the original type series.

59. **Empoasca coccinea** Fitch, 1851a:63.

Empoasca coccinea (Fitch).

Original Specimens: *4932, Salem, NY, 5. vii. 1847, on pine leaves in pine woods (State Cabinet).

60. **Helochara communis** Fitch, 1851a:56.

Helochara communis Fitch.

Original Specimens: 2490, Salem, NY, 1827; 1231-32, Stillwater, NY, 22. iv. 1837, on surface of water at the "Fly Bridge" – in swamp north of village; 6849-52, Salem, NY, 1838; *799 Salem, NY, 28. iv. 1845, in meadow south of Black Creek; *1995, Salem, NY, 6. iv. 1846, in woods on big hill; *2068, Salem, NY, 20. iv. 1846, among grass in the meadow; *2134-37, Salem, NY, 21. iv. 1846, among grass growing in a pool of water upon Jarvis Marten's hills; *2384, Salem, NY, 6. v. 1846, on dry bed of sand in the meadow; *4109-18, Salem, NY, 10. xi. 1846, on grass in meadow in vast numbers; 12,475, Salem, NY, Spring 1847; *5895, Salem, NY, Spring 1847, on Harvey Fitch's flat, near the spring; 456-47, Winhall, VT, 17. vi. 1847, near top of Green Mountains; *6130, Salem, NY, 21. viii. 1847, on blackberry bushes near McDougall's Lake; 12,664-666, Salem, NY, 15. xi. 1850, abundant on grass in a wet situation, by the swamp in Mrs. Fitch's back field; 12,699, Salem, NY, 15. xi. 1850, on grass; *8436, Salem, NY, 25. iv. 1851, on pools of water in the meadow; *8497-99, Salem, NY, 26. iv. 1851, on pools of water in the meadow; *8556-57, 29. iv. 1851, on

pools of water in the meadow; *8760-61, Salem, NY, 10. v. 1851, on grass in a marshy spot, Titus's hill; *9574-75, Salem, NY, 9. vi. 1851, on grass in a marshy spot, by Jarvis Martin's woods; *9948, Salem, NY, 12. vi. 1851, on grass, damp ground, in meadow; *9997-99, Salem, NY, 21. vii. 1851, on grass and rushes, marshy ground, in meadow; **10,060, Salem, NY, 22. vii. 1851, on rushes, by water in the meadow.

Extant Specimens: *8761/140B (MCZH); Fitch's Type/ Fitch's Collection/ *Helochara communis* Fitch (USNM, 2 specimens); 753/Male (NYSM); 754/Female (NYSM); 755/Var. a (NYSM).

Note: Two specimens in the USNM Collection, bearing Fitch's labels 3459 and 6922 in red ink, and also labelled "Fitch's Collection," are from Mississippi and were collected in 1852. Therefore, they are not part of the original type series.

61. **Amblycephalus curtisii** Fitch, 1851a:61.

Amblysellus curtisii (Fitch).

Original Specimens: *2972, Jackson, NY, 16. vi. 1846, on birch tree beside the kill below Deacon Small's; 11,816, Stillwater, NY, 16. vii. 1846, hills west of grandmother's; *4663, Salem, NY, 28. vi. 1847, on walnut, Jarvis Martin's woods; *4910, Salem, NY, 5. vii. 1847, on grass, Esq. Martin's pasture; *4950, Salem, NY, 8. vii. 1847, in the office; *5230, Salem, NY, 21. vii. 1847, on sugar maple, Sidney Martin's meadow; *5252, Salem, NY, 21. vii. 1847, on sumach, Sidney Martin's meadow; *5539, Salem, NY, 29. vii. 1847, on *Cornus panic*; north of Black Creek; *6452-57, Salem, NY, 10. ix. 1847, on grass, Esq. Martin's meadow; 12,658-659, Salem, NY; 12. ix. 1850, on grass in meadow; 12,701-703, Salem, NY, 22. xi. 1850, on grass in front yard; *9886, Salem, NY, 5. vii. 1851, on grass in the meadow; 13,382-383, Whitestown, NY, 16. ix. 1851, bushes along the Mohawk R.; *10,346, Salem, NY, 20. xi. 1851, on snow, on the wood lot by McDougall's Lake.

Extant Specimens: 12,702/ *Amblycephalus curtisii* Fitch/164 (MCZH); *Amblycephalus curtisii* Fitch, New York/Fitch's Collection (USNM); Var. a/Fitch's Type/Fitch's Collection (USNM); Fitch's Type/Fitch's Collection (USNM); 798/Male (NYSM); 799/Female (NYSM).

62. **Athysanus fagi** Fitch, 1851a:61.

Oncopsis fagi (Fitch).

Original Specimens: *2847, Granville, NY, 11. vi. 1846, on leaves of beech tree.

Extant Specimens: 796/Female (NYSM).

63. **Athysanus fenestratus** Fitch, 1851a:60.

Oncopsis fitchi Van Duzee.

Original Specimens: *2970, Jackson, NY, 16. vi. 1846, on white birch; *3367, Salem, NY, 13. vii. 1846, on white birch near foot-bridge in meadow; *4621, Salem, NY, 28. vii. 1846, on birch, Jarvis Martin's woods.

Extant Specimens: *Athysanus fenestratus* Fitch, New York/ Fitch's Type/Fitch's Collection (USNM); 794 (NYSM); Female (NYSM).

64. **Gypona flavilineata** Fitch, 1851a:57.

Gyponana flavilineata (Fitch).

Original Specimens: 2479, Salem, NY, 1827; 4806, Stillwater, NY, x. 1837; *3170, Salem, NY, 3. vii. 1846, on

- Carpinus americ.* in Harvey's meadow; *3231, Greenwich, NY, 6. vii. 1846, in woods north of P. C. Dunlap's; *3342-44, Salem, NY, 13. vii. 1846, on bushes near foot bridge over White Creek; *3366, Salem, NY, 13. vii. 1846, on white birch near foot bridge over White Creek; 11,736, Stillwater, NY, 16. vii. 1846, on bitter walnut, southwest of grandmother's; *3576-78, Salem, NY, 24. vii. 1846, on beech trees, Jarvis Martin's woods; *3786, Salem, NY, 29. vii. 1846, on white oak, along edge of dugway woods; *3884, Salem, NY, 11. viii. 1846, on white oaks, S. Martin's back pasture; *5171-72, Stillwater, NY, 15. vii. 1847, on walnut bushes; *5538, Salem, NY, 29. vii. 1847, on *Cornus paniculata*, north side of Black Creek; *5944, Salem, NY, 19. viii. 1847, pasture over the creek; *6049, Salem, NY, 19. viii. 1847, east side of Mrs. Fitch's woods on maple; *6070-72, Salem, NY, 19. viii. 1847, east side of Mrs. Fitch's woods, on hickory; *6109-10, Salem, NY, 19. viii. 1847, east side of Mrs. Fitch's woods, pupae; *6148-49, Salem, NY, 21. viii. 1847, on beech, about McDougall's Lake; *6229-30, Salem, NY, 4. ix. 1847, on white oaks, northwest corner of mill lot; *6304, Salem, NY, 10. ix. 1847, on willows, Esq. Martin's meadow; *6624, Greenwich, NY, 20. ix. 1847, on maples, by Cossayuna Lake; 1150, Tullehassie, AR, Spring 1850, from Wm. S. Robertson; 3083-84, Tullehassie, West of AR, vii. 1851, from Wm. S. Robertson; 13,430-31, Whitestown, NY, 16. ix. 1851, on *Aster* and *Solidago* flowers by Mohawk R.
- Extant Specimens: *6304/148 (MCZH); P. R. Uhler Collection/ *Gypona flavilineata* Fitch, Type, Male (USNM); Fitch's Type/Fitch's Collection/Type No. 629 (USNM); 757/ Male (NYSM); 758 (NYSM); Female/Paratype of *Gypona flavilineata* Fitch (#7584) (NYSM).
- Note: A specimen in the USNM collection, bearing Fitch's label 6706, and also labelled "Fitch's Type, Fitch's Collection, *Gypona flavilineata* Fh., female, Type No. 629" is from Tullehassie, Arkansas, October 1852, according to Fitch's specimen registers. It is, therefore, not part of the original type series.
65. **Jassus fulvidorsum** Fitch, 1851a:62.
Paraphlepsius fulvidorsum (Fitch).
Original Specimens: *6139-40, Salem, NY, 21. vii. 1847, on black birch, near McDougall's Lake; *6173-78, Salem, NY, 21. viii. 1847, on white pine, near McDougall's Lake; 12,631, Salem, NY, 14. ix. 1850, on wild poplars, south side of big hill.
Extant Specimens: *6178/ *Jassus fulvidorsum* Fitch/158 (MCZH); Fitch's Type/Fitch's Collection/ *Jassus fulvidorsum* Fitch, Wash'tn. Co., New York (USNM); 816/Male (NYSM); 817/Female (NYSM).
66. **Idiocerus lachrymalis** Fitch, 1851a:58.
Idiocerus lachrymalis Fitch.
Original Specimens: 11,611, Salem, NY, 30. vi. 1846, beat from a hemlock tree in Jarvis Martin's woods; *3920, Salem, NY, 11. viii. 1846, on walnut bushes, S. Martin's back pasture; *6062-64, Salem, NY, 19. viii. 1847, on wild poplar, east side of Mrs. Fitch's woods; 12,626-29, Salem, NY, 14. ix. 1850, on poplar bushes, south side of big hill.
Extant Specimens: 773/Male (NYSM); 774/Female (NYSM); 775/var. a (NYSM); 776/var. b (NYSM); 777 var. c (NYSM); 778/var. d (NYSM).
67. **Idiocerus maculipennis** Fitch, 1851a:59.
Idiocerus fitchi Van Duzee.
Original Specimens: *3649, Salem, NY, 27. vii. 1846, on thorn bushes in Esq. Martin's meadow; *4674, Salem, NY, 28. vi. 1847, on thorn, Jarvis Martin's woods.
Extant Specimens: Fitch's Type/Fitch's Collection/ *Idiocerus maculipennis* Fitch, New York (USNM).
68. **Amblycephalus melsheimerii** Fitch, 1851a:61.
Laeviccephalus melsheimerii (Fitch).
Original Specimens: *4911, Salem, NY, 5. vii. 1847, on grass in Esq. Martin's pasture; *4933, Salem, NY, 5. vii. 1847, on pine bushes, pine woods; *6141, Salem, NY, 21. viii. 1847, on black birch, by McDougall's Lake; 12,526, Salem, NY, 1847, about the house; 12,686-695, Salem, NY, 15. xi. 1850, on grass.
Extant Specimens: *4911/ *Amblycephalus melsheimerii* Fitch/163 (MCZH); 12,691/P. R. Uhler Collection/ *Amblycephalus melsheimerii* Fitch, Det. Uhler (USNM); *Amblycephalus melsheimerii* Fitch, New York/Fitch's Type/ Fitch's Collection/Not on pin 3.iii.31 (USNM); 806/Female (NYSM).
69. **Athysanus minor** Fitch, 1851a:60.
Oncopsis fitchi Van Duzee.
Original Specimens: *2977, Jackson, NY, 16. vi. 1846, on white birch tree, beside the kill; 11,608, Salem, NY, 24. vi. 1846, on the big hill?; *3073, *3076, Salem, NY, 24. vi. 1846, on hazelnut bushes, Battle Hill; *3368, Salem, NY, 13. vii. 1846, on white birch, near foot bridge, in meadow; *3611, Salem, NY, 24. vii. 1846, on birch tree leaves, Jarvis Martin's woods; *4867-74, Salem, NY, 5. vii. 1847, on black and white birch along the kill, in Esq. Martin's fields; *4997-98, Salem, NY, 10. vii. 1847, on white birch near foot bridge; *5663, Salem, NY, 6. viii. 1847, on black cherry tree, Esq. Martin's field; *6138, Salem, NY, 21. viii. 1847, on black birch, near McDougall's Lake; 10,112, Salem, NY, 25. vii. 1851, on birch, border of the meadow.
Extant Specimens: *4869/ *Athysanus minor* Fitch/173 (MCZH); *Athysanus minor* Fitch/Fitch's Type/Fitch's Collection (USNM); 795 (NYSM); Female (NYSM).
70. **Athysanus nigrinasi** Fitch, 1851a:61.
Oncopsis nigrinasi (Fitch).
Original Specimens: *2983, Jackson, NY, 16. vi. 1846, on *Carpinus*, bank of kill below Deacon Small's; *3082, Salem, NY, 24. vi. 1846, on white birch, by foot bridge; *3054, Salem, NY, 24. vi. 1846, on birch?, on Battle Hill; *3166-67, Salem, NY, 3. vii. 1846, on *Carpinus*, in Harvey's meadow; *3185, Salem, NY, 3. vii. 1846, on butternut, in Harvey's meadow; *3610, Salem, NY, 24. vii. 1846, on birch, Jarvis Martin's woods; *3686, Salem, NY, 27. vii. 1846, on *Carpinus* in Esq. Martin's meadow; *3742-45, Salem, NY, 28. vii. 1846, on *Carpinus* in the meadow; *5290, Salem, NY, 21. vii. 1847, on *Carpinus*, Sidney Martin's meadow.
Extant Specimens: *2983/ *Athysanus nigrinasi* Fitch/170 (MCZH); *Athysanus nigrinasi* Fitch, New York/Fitch's Type/ Fitch's Collection/(USNM); 797 (NYSM); Female (NYSM).
71. **Aulacizes noveboracensis** Fitch, 1851a:56.
Draeculacephala noveboracensis (Fitch).
Original Specimens: *6581, Salem, NY, 11. ix. 1847, on the grass, in Esq. Martin's meadow; *9935-39, Salem, NY,

12. vii. 1851, on grass in the meadow; *10,056-58, Salem, NY, 22. vii. 1851, on rushes, by the water in the meadow; *10,093, Salem, NY, 22. vii. 1851, on brakes, lower island in the meadow.
Extant Specimens: *9936/ *Aulacizes noveboracensis* Fitch/144 (MCZH); 752/Female (NYSM).
Note: Two specimens in the USNM collection bear Fitch's labels **1964 and *2032, and they are also labelled as Fitch's types. According to Fitch's specimen registers these specimens were collected in 1852, and, therefore, they are not part of the original type series.
72. ***Evacanthus orbitalis*** Fitch, 1851a:57.
Evacanthus acuminatus (Fabricius).
Original Specimens: *5457, Salem, NY, 27. vii. 1847, on *Cornus paniculata*, Esq. Martin's meadow; *5544, Salem, NY, 29. vii. 1847, on *Cornus paniculata*, meadow along Black Creek; *10,077-086, Salem, NY, 22. vii. 1851, on brakes, lower island in the meadow; *10,110, Salem, NY, 25. vii. 1851, on brakes, lower island in the meadow.
Extant Specimens: Fitch's Type/Fitch's Collection/ *Evacanthus orbitalis* Fitch, New York/Type No. 628, (USNM); Fitch's Type/Fitch's Collection/Var. a (USNM); 756/Male (NYSM).
73. ***Idiocerus pallidus*** Fitch, 1851a:59.
Idiocerus pallidus Fitch.
Original Specimens: *3717, Salem, NY, 28. vii. 1846, on maples along the creek in the meadow; *5002, Salem, NY, 10. vii. 1847, attracted by candle light; *5183, Stillwater, NY, 15. vii. 1847, on chestnut bushes; *6059-61, Salem, NY, 19. viii. 1847, on wild poplars, east side of Mrs. Fitch's woods; *6309-14, Salem, NY, 10. ix. 1847, on willows, Esq. Martin's meadow; *6507-09, Salem, NY, 11. ix. 1847, on willows, Esq. Martin's meadow; 12,622-623, Salem, NY, 14. ix. 1850, on wild poplar, south side of big hill; *9831-35, Salem, NY, 5. vii. 1851, on willows, in the meadow; *10,098, Salem, NY, 22. vii. 1851, in the house, in the evening; *10,148, Salem, NY, 25. vii. 1851, on grape vine in the meadow.
Extant Specimens: *6059/ *Id. pallidus* Fitch/178 (MCZH); *9834/178A (MCZH); *Idiocerus pallidus* Fitch, New York/ Fitch's Type/Fitch's Collection (USNM).
74. ***Empoa querci*** Fitch, 1851a:63.
Empoa querci Fitch.
Original Specimens: *3044-51, Salem, NY, 24. vi. 1846, beat from white oak trees on the big hill, 11,808-809, Stillwater, NY, 16. vii. 1846, hills west of grandmothers; *4840, Salem, NY, 5. vii. 1847, on white oak in Esq. Martin's pasture; *5123-25, Stillwater, NY, 15. vii. 1847, on oak bushes; *5164, Stillwater, NY, 15. vii. 1847, on walnut bushes; *5378, Salem, NY, 23. vii. 1847, on white oak, top of dugway hill; *6143, Salem, NY, 21. viii. 1847, on white oak, near McDougall's Lake; 13,295, 13,299, 13,301, Stillwater, NY, vii. 1848, on oak bushes, 1888-89, New Brunswick, NJ, 23. ix. 1851, on oak bushes; *10,473, Salem, NY, 9. x. 1851, on oak bushes, Titus's hill.
Extant Specimens: 13,299/ *Empoa querci* Fitch/198 (MCZH).
75. ***Amblycephalus sayii*** Fitch, 1851a:61.
Latalus sayii (Fitch).
Original Specimens: *3020, Salem, NY, vi. 1846, on plants in the yard; *4695, Salem, NY, 28. vi. 1847, on the wing, Jarvis Martin's woods; *5456, Salem, NY, 27. vii. 1847, on *Cornus paniculata*, Esq. Martin's meadow; *5545, Salem, NY, 29. vii. 1847, on *Cornus paniculata*, meadow north of Black Creek; *6144, Salem, NY, 21. viii. 1847, on white oak, near McDougall's Lake; 499, northwest corner of Arlington, VT, 23. viii. 1847; *6323, Salem, NY, 10. ix. 1847, on willows, Esq. Martin's meadow; *6375, *6378, *6380, Salem, NY, 10. ix. 1847, on hazelnut bushes, Esq. Martin's meadow; *6463-71, *6584, Salem, NY, 10. ix. 1847, on grass, Esq. Martin's Meadow; *7194-95, Salem, NY, late autumn, 1847; 12,606, Salem, NY, 14. ix. 1850, on alder bushes, in meadow; 12,656, Salem, NY, 12. xi. 1850, on grass in meadow; 12,692, Salem, NY, 12. xi. 1850, on grass; 12,704, Salem, NY, 22. xi. 1850, on grass in front yard; *9234, Salem, NY, 30. v. 1851, on weeds, Esq. Martin's meadow; *9433-37, Salem, NY, 5. vi. 1851, on grass, north-west corner of mill lot; *9671, Salem, NY, 17. vi. 1851, on marsh grass, by McDougall's Lake; *9890, Salem, NY, 5. vii. 1851, on grass in the meadow; *10,475, Salem, NY, 9. x. 1851, on oaks, Titus's hill.
Extant Specimens: *9234/ *Amblycephalus sayii* Fitch/162 (MCZH); *Amblycephalus sayii* Fitch, New York/Fitch's Type/Fitch's Collection (USNM); Fitch's Type/Fitch's Collection/ *Amblycephalus sayii* Fitch (USNM); 800/Male (NYSM); 801/ Female (NYSM); 802/Var. a (NYSM); 803/Var. b (NYSM); 804/Var. c (NYSM).
76. ***Gypona scarlatina*** Fitch, 1851a:57.
Ponana scarlatina (Fitch).
Original Specimens: *5001, Salem, NY, 10. vii. 1847, attracted into the house by the light of a candle in the evening.
Extant Specimens: N. Y. /P. R. Uhler Collection/ *Gypona scarlatina*, NY/Fitch!/Type! (USNM).
77. ***Bythoscopus strobi*** Fitch, 1851a:58.
Paraphlepsius strobi (Fitch).
Original Specimens: *2546, *2686-87, Salem, NY, 20. v. 1846, beat from leaves of the white pine, northwest corner of mill lot; *7565-71, Salem, NY, 26. v. 1848, on pines, north-west corner of mill lot; 1104, Tullehassie, AR, spring 1851, from Wm. S. Robertson; *9396-97, Salem, NY, 5. vi. 1851, on pine bushes, mill lot.
Extant Specimens: *9397/ *B. strobi* Fitch/167 (MCZH); *Bythoscopus strobi* Fitch, New York/Fitch's Type/Fitch's Collection (USNM); 772 (NYSM).
78. ***Idiocerus suturalis*** Fitch, 1851a:59.
Idiocerus suturalis Fitch.
Original Specimens: *5002, Salem, NY, 10. vii. 1847, attracted by light in the evening, in the house; *5183, Stillwater, NY, 15. vii. 1847, beat from chestnut bushes.
Extant Specimens: *Idiocerus suturalis* Fitch, New York/ Fitch's Type/Fitch's Collection (NYSM).
79. ***Bythoscopus tergatus*** Fitch, 1851a:58.
Chlorotettix tergatus (Fitch).
Original Specimens: *6510, Salem, NY, 11. ix. 1847, on willows in Esq. Martin's meadow.
Extant Specimens: 766/Male (NYSM).

80. **Erythroneura tricineta** Fitch, 1851a:63.
Erythroneura tricineta Fitch.
 Original Specimens: *6293, Salem, NY, 10. ix. 1847, on black raspberry bushes, in Esq. Martin's meadow; *6331, Salem, NY, 10. ix. 1847, on willows, in Esq. Martin's meadow; *6401-03, Salem, NY, 10. ix. 1847, on grape vines, in Esq. Martin's meadow; *6473, Salem, NY, 10. ix. 1847, on grass, in Esq. Martin's meadow; *6561, Salem, NY, 11. ix. 1847, on grape vines, in Esq. Martin's meadow; *6568, Salem, NY, 11. ix. 1847, on *Cornus paniculata*, in Esq. Martin's meadow; *6604-06, Greenwich, NY, 20. ix. 1847, along the lake, on grape vines.
 Extant Specimens: *6402/ *Erythr. tricineta* Fitch/193 (MCZH).
81. **Pediopsis trimaculatus** Fitch, 1851a:60.
Macropsis trimaculata (Fitch).
 Original Specimens: *3233, Greenwich, NY, 6. vii. 1846, woods north of P. Dunlap's; *7605, Salem, NY, vi. 1848.
 Extant Specimens: 785/ Female (NYSM).
82. **Tettigonia tripunctata** Fitch, 1851a:55.
Plesiommatia tripunctata (Fitch).
 Original Specimens: *5543, Salem, NY, 29. vii. 1847, on *Cornus paniculata*, in meadow north of Black Creek.
 Extant Specimens: 742/ Male (NYSM).
 Note: Two specimens in the USNM collection bear Fitch's labels **5074 and **5078, and they are also labelled "Fitch's Type." According to Fitch's specimen registers, these specimens were collected in 1854, and, therefore, they are not part of the original type series.
83. **Bythoscopus unicolor** Fitch, 1851a:58.
Chlorotettix unicolor (Fitch).
 Original Specimens: 6268, Canajoharie, NY, from Wm. S. Robertson; 4946, Stillwater, NY, 14. ix. 1837, on *Solidago* flowers, bank of river; *4909, Salem, NY, 5. vii. 1847, on grass, Esq. Martin's pasture; *5082, Saratoga Springs, NY, 16. vii. 1847, on grass; 498, northeast corner of Arlington, VT, 23. viii. 1847; *6232, Salem, NY, 4. ix. 1847, on white oaks, northwest corner of mill lot; 13,283, Stillwater, NY, vii. 1848, on walnut bushes; 13,294, Stillwater, NY, vii. 1848, on oaks; 12,616, Salem, NY, 14. ix. 1850, on maples, north side of Battle Hill; 12,625, Salem, NY, 14. ix. 1850, on poplar, south side of Battle Hill; 1583-84, Tullehassie, AR, 1. vi. 1851, on grass, from Wm. S. Robertson; 1792-93, 3090-93, Tullehassie, AR, vii. 1851, from Wm. S. Robertson; 3142, Windsor, MA, 25. vii. 1851, from Thos. B. Ashton; 2078, Tullehassie, AR, 20. viii. 1851, from Wm. S. Robertson; 2021-24, Tullehassie, AR, viii. 1851, from Wm. S. Robertson; 1882, New Brunswick, NJ, 23. ix. 1851, on oak or walnut bushes.
 Extant Specimens: 2021/ *B. unicolor* Fitch/168 (MCZH); *4909/ 168A (MCZH); Fitch Type/ Fitch's Collection/ *Bythoscopus unicolor* Fitch, New York (USNM); 767/ Female (NYSM).
84. **Athysanus variabilis** Fitch, 1851a:60.
Oncopsis variabilis (Fitch).
 Original Specimens: *2955-69, Jackson, NY, 16. vi. 1846, on a white birch beside Batten Kill; *3181, Salem, NY, 3. vii. 1846, on *Cornus paniculata*, in Harvey's meadow; *3362-64, Salem, NY, 13. vii. 1846, on alders near the foot bridge; *4625-30, Salem, NY, 28. vi. 1847, on birch, Jarvis Martin's woods; *4863, Salem, NY, 5. vii. 1847, on white birch, bank of Batten Kill; *9814-23, Salem, NY, 5. vii. 1851, on alder leaves in the meadow.
 Extant Specimens: *9822, *Athysanus variabilis* Fitch/ 171 (MCZH); Fitch's Type/ Fitch's Collection/ *A. variabilis* (USNM, 14 specimens); 786/ Female (NYSM); 787/ Var. a (NYSM); 788/ Var. b (NYSM); 789/ Var. c (NYSM); 790/ Var. d (NYSM); 791/ Var. e (NYSM); 792/ Var. f (NYSM).
85. **Pediopsis viridis** Fitch, 1851a:59.
Macropsis viridis (Fitch).
 Original Specimens: *5169, Stillwater, NY, 15. vii. 1847, beat from walnut bushes; *7889, Salem, NY, 25. vii. 1848, willows, S. Martin's meadow (female, placed in New York State Cabinet of Natural History); *9723, Salem, NY, 23. vi. 1851, on willows, in the meadow; *9811, Salem, NY, 5. vii. 1851, on milkweed flowers, in the meadow; *9836-40, Salem, NY, 5. vii. 1851, on willows, in the meadow; **150-154, Salem, NY, 25. vii. 1851, on willows, in the meadow.
 Extant Specimens: *9836/ *Pediopsis viridis* Fitch/185 (MCZH); **153/ 185A (MCZH); 784/ Female (NYSM).
86. **Acocephalus vitellinus** Fitch, 1851a:57.
Fitchana vitellina (Fitch).
 Original Specimens: 11,791, Stillwater, NY, 16. vii. 1846, hills west of grandmother's; 12,615, Salem, NY, 14. ix. 1850, on maple, north side of big hill; 12,624, Salem, NY, 14. ix. 1850, on poplar, south side of big hill.
 Extant Specimens: Fitch's Type/ Fitch's Collection (USNM); 762/ Female/ Male (NYSM); 763/ Var. a, Female (NYSM).
87. **Erythroneura vitifex** Fitch, 1857m:392.
Erythroneura vitifex Fitch.
 Original Specimens: *6290-91, *6295, Salem, NY, 10. ix. 1847, on black raspberry bushes in Esq. Martin's meadow; *6404-05, Salem, NY, 10. ix. 1847, on grape vine in Esq. Martin's meadow; *6608-18, Greenwich, NY, 20. ix. 1847, on grape vine along Cossayuna Lake; *9083, Salem, NY, 19. v. 1851, on wild currant bushes in the meadow; 1898, New Brunswick, NJ, 23. ix. 1851, on walnut and oak leaves; *10,441, Salem, NY, 8. x. 1851, on alder, in the meadow; 14,532-33, Salem, NY, 2. viii. 1856, on grape vine, in pupa state.
88. **Erythroneura vulnerata** Fitch, 1851a:62.
Erythroneura vulnerata Fitch.
 Original Specimens: *1997-98, Salem, NY, 6. iv. 1846, in woods on big hill; *4334, Salem, NY, late in autumn of 1846; *6296-99, Salem, NY, 10. ix. 1847, on black raspberry bushes, Esq. Martin's meadow; *6406, Salem, NY, 10. ix. 1847, on grape vine, Esq. Martin's meadow; *6467, Salem, NY, 10. ix. 1847, on grass, Esq. Martin's meadow; *6567, Salem, NY, 11. ix. 1847, on *Cornus paniculata*, in Esq. Martin's meadow; *6620-21, *6628-30, Greenwich, NY, 20. ix. 1847, on grape vine, along Cossayuna Lake; *7297-99, Salem, NY, 12. v. 1848, on black currant bushes in the meadow; *8037, Salem, NY, 9. vi. 1851, in moss from a tree on the wood lot; 1886, New Brunswick, NJ, 23. ix. 1851, on walnut bushes.
 Extant Specimens: *6621/ *Erythr. vulnerata* Fitch/194 (MCZH); *6629/ 194A (MCZH); *6467 (MCZH); 819/ Male (NYSM); 820/ Female (NYSM).

Family CERCOPIDAE

89. **Clastoptera proteus cincticollis** Fitch, 1851a:54.
Clastoptera proteus Fitch.
Extant Specimens: 725/Var. a (NYSM); 727/Var. c (NYSM).
90. **Clastoptera proteus flavicollis** Fitch, 1851a:54.
Clastoptera proteus Fitch.
Extant Specimens: 723/Var. a (NYSM); 724/ Var. b (NYSM).
91. **Monecphora ignipectus** Fitch, 1857m:389.
Prosapia ignipectus (Fitch).
92. **Clastoptera proteus maculicollis** Fitch, 1851a:54.
Clastoptera proteus Fitch.
Extant Specimens: 729/Var. a (NYSM); 730/ Var. b (NYSM); 731/Var. c (NYSM).
93. **Clastoptera proteus nigricollis** Fitch, 1851a:55.
Clastoptera proteus nigricollis Fitch.
Extant Specimens: 733/Var. a (NYSM); 734/ Var. b (NYSM); 735/Var. c (NYSM); 736/Var. d (NYSM).
94. **Clastoptera pini** Fitch, 1851a:53.
Clastoptera testacea Fitch.
Original Specimens: *5127, Stillwater, NY, 15. vii. 1847, beat from oak bushes; *5327-34, Salem, NY, 23. vii. 1847, beat from leaves of white pine limbs along the top of the dugway hill.
Extant Specimens: *5333/Fitch's Type/Fitch's Collection/ *C. testacea* Fitch, Det. Doering/Type No. 622, U. S. N. M. / *Clastoptera* Germar, *pini* Fitch, New York (USNM); 719/Male (NYSM); 720/Var. a (NYSM); 721/Var. b (NYSM).
95. **Clastoptera proteus** Fitch, 1851a:54.
Clastoptera proteus Fitch.
Original Specimens: *3656, Salem, NY, 27. vii. 1846, on *Cornus paniculata*, in Esq. Martin's meadow; *5477, *5498, *5507, *5509, Salem, NY, 27. vii. 1847, on *Cornus paniculata*, in Esq. Martin's meadow; *5516, *5523, Salem, NY, 29. vii. 1847, on *Cornus paniculata*, north side of Black Creek; *7863, Salem, NY, 25. vii. 1848, border of Esq. Martin's meadow.
Extant Specimens: *3656/ *Clastoptera proteus* Fitch/132 (MCZH); *5477/132A (MCZH); *5507/132C (MCZH); *5516/132B (MCZH); *5523/132D (MCZH); *5509/Fitch's Type/Fitch's Collection/Type No. 624 (USNM); *5498/Type No. 624 (USNM); *7863/Fitch's Type/Fitch's Collection/Type No. 624 (USNM); 722/Female (NYSM).
96. **Lepyronia saratogensis** Fitch, 1851a:53.
Aphrophora saratogensis (Fitch).
Original Specimens: 4660, Stillwater, NY, 2. ix. 1837, about Burgoyne's breastwork, southwest of Wilbur's basin; *3425-27, Stillwater, NY, 16. vii. 1846, west of grandmother's; *3897, Salem, NY, 11. viii. 1846, on poplars, Titus's hill, north of Fitch's point; *3919, Salem, NY, 11. viii. 1846, on walnut, Titus's hill; 11,780, 11,800, Stillwater, NY, 16. vi. 1846, west of grandmother's, on pine; *5098, *5182, Stillwater, NY, 15. vii. 1847, on maple and chestnut bushes; 12,591, Salem, NY, 17. ix. 1850, on pines, northwest corner of mill lot.
Extant Specimens: *5182/Fitch's Type/Fitch's Collection/ *L. saratogensis*, Fh. /Type No. 1021 (USNM); Fitch's Type/

Fitch's Collection/Type No. 1021/ *Aphrophora saratogensis* F. (USNM); 710/Male (NYSM); 711/Female (NYSM); 712/Var. a (NYSM).

97. **Aphrophora signoretii** Fitch, 1857m:388.
Aphrophora signoretii Fitch.
Original Specimens: 11,781, Stillwater, NY, 16. vii. 1846, on grape vine (wild).
98. **Clastoptera testacea** Fitch, 1851a:53.
Clastoptera testacea Fitch.
Original Specimens: *3568, Stillwater, NY, 16. vii. 1846, on *Viburnum lentago* bushes, southwest of grandmother's; *3587, Salem, NY, 24. vii. 1846, on pine bushes in Jarvis Martin's woods; *3805-06, Salem, NY, 29. vii. 1846, on pine bushes, along the dugway woods; *5320-26, Salem, NY, 23. vii. 1847, on pine bushes, along the dugway woods; *5403-04, Salem, NY, 23. vii. 1847, on yellow oak, along the dugway woods; *6024, Salem, NY, 19. viii. 1847, on white oak, on Titus's hill; *6172, Salem, NY, 21. viii. 1847, on white pine, near McDougall's Lake; *6235-36; Salem, NY, 4. ix. 1847, on white oaks, northwest corner of mill lot.
Extant Specimens: *5322/ *Clastoptera testacea* Fitch/131 (MCZH); *6172/Fitch's Type/Fitch's Collection/*C. testacea* Fitch/Type No. 623 (USNM); 715 (NYSM); Female (NYSM); 716/Var. a (NYSM); 717/Var. b (NYSM); 718 (NYSM)).

Family DELPHACIDAE

99. **Delphax arvensis** Fitch, 1851a:46.
Delphacodes arvensis (Fitch).
Original Specimens: 12,356-61, Salem, NY, 3. vi. 1847, in Jarvis Martin's wheat; *9506-07, Salem, NY, 9. vi. 1851, on flowers of *Potentilla*, west of Jarvis Martin's woods; *9981, Salem, NY, 21. vii. 1851, on grass and rushes, wet ground by creek; 2029, Tullehassie, AR, viii. 1851, from Wm. S. Robertson.
Extant Specimens: 12,358/ *Delphax arvensis* Fitch/114 (MCZH); 622/Male (NYSM); 623/Female (NYSM).
100. **Delphax dorsalis** Fitch, 1851a:46.
Stenocranus dorsalis (Fitch).
Original Specimens: *4253, Salem, NY, 2. ii. 1847, on melting snow, in the woods near McDougall's Lake; *8438, Salem, NY, 25. iv. 1851, on pools of water in meadow; *8500-02, Salem, NY, 26. vi. 1851, on the margin of a pool of water in the meadow, flying from the grass and walking on the water; *8550-53, Salem, NY, 29. iv. 1851, on the surface of pools of water in the meadow; *8575-82, Salem, NY, 29. iv. 1851, on sedge grass, beside pools of water in the meadow; *8672-78, Salem, NY, 7. v. 1851, on sedge grass beside pools of water in the meadow; *8759, Salem, NY, 10. v. 1851, on grass, marshy ground, Titus's hill; *9771-72, Hartford, NY, 27. vi. 1851, on grass about the big swamp; *10,309-311, Salem, NY, 20. xi. 1851, on snow, in the woods near McDougall's Lake; *10,312, Salem, NY, 21. xi. 1851, on snow, meadow below Jarvis Martin's.
Extant Specimens: *8500/ *Delphax dorsalis* Fitch/113 (MCZH); *8578/113A (MCZH); 621/Male (NYSM).

Family DERBIDAE

101. **Otiocerus amyotii** Fitch, 1857m:394.
Otiocerus amyotii Fitch.

Original Specimens:11,735, Stillwater, NY, 16. vii. 1846, on bitter walnut, southwest of grandmother's; 13,272, Stillwater, NY, vii. 1848, on walnut bushes, west of grandmother's; 1874, New Brunswick, NJ, 23. ix. 1851, on walnut bushes.

Extant Specimens:13,272/Fitch's Collection/Fitch's Type/Type No. 588 (USNM).

102. **Anotia burnetii** Fitch, 1857m:395.

Anotia burnetii Fitch.

Original Specimens:Henderson River, IL, 2. x. 1854, beat from ash bushes by Albert Gallatin Burnet.

Extant Specimens:Illinois/Fitch's Collection/Fitch's Type/Type No. 591 (USNM).

103. **Otiocerus kirbyii** Fitch, 1851a:46.

Otiocerus kirbyii Fitch.

Original Specimens:11,728, Stillwater, NY, 15-16. vii. 1846, on oak bushes, southwest of grandmother's; 11,734, Stillwater, NY, 15-16. vii. 1846, on bitter walnut, southwest of grandmother's; 11,737, Stillwater, NY, 15-16. vii. 1846, on *Viburnum lentago*, southwest of grandmother's; 11,738, Stillwater, NY, 16. vii. 1846, on oak bushes in big swamp.

Extant Specimens:Fitch's Collection/Fitch's Type/ 11,728/Type No. 589 (USNM).

Note: Two specimens in the USNM collection bear Fitch's labels **8400 and **8401, and they are also labelled "Fitch's Type, Fitch's Collection." According to Fitch's specimen registers, these specimens were collected in 1858, and, therefore, they are not part of the original type series.

104. **Anotia robertsonii** Fitch, 1857m:395.

Anotia robertsonii Fitch.

Original Specimens:1750-51, Tullehassie, AR, vii. 1851, from Wm. S. Robertson.

Extant Specimens:1750/Fitch's Collection/Fitch's Type/Type No. 592 (USNM); 1751/Fitch's Type/Fitch's Collection/Type No. 592 (USNM).

105. **Otiocerus signoretii** Fitch, 1857m:394.

Otiocerus signoretii Fitch.

Original Specimens:2054, Tullehassie, AR, viii. 1851, from Wm. S. Robertson; 2150, Tullehassie, AR, x. 1851, on dogwood bushes, from Wm S. Robertson.

Extant Specimens:2054/Fitch's Collection/Fitch's Type/Type No. 587 (USNM).

106. **Poeciloptera (?) vulgaris** Fitch, 1851a:47.

Cedusa vulgaris (Fitch).

Original Specimens: *5112, Stillwater, NY, 15. vii. 1847, beat from oak bushes; *5227, Salem, NY, 21. vii. 1847, on sugar maple, in Sidney Martin's meadow; *5272, Salem, NY, 21. vii. 1847, on thorn, in Sidney Martin's meadow.

Extant Specimens: *5112/Fitch's Type/Fitch's Collection/Type No. 585 (USNM); *5227/Fitch's Type/Fitch's Collection/Type No. 585 (USNM); *5272/Fitch's Type/Fitch's Collection/Type No. 585 (USNM); Fitch's Type/Fitch's Collection/Type No. 585 (USNM, 2 specimens); 639/Male (NYSM); 640/Female (NYSM).

107. **Anotia westwoodii** Fitch, 1857m:394.

Anotia westwoodii Fitch.

Original Specimens: *6300-03, Salem, NY, 10. ix. 1847, on willow bushes, Esq. Martin's meadow; *6500-01, Salem,

NY, 11. ix. 1847, on willow bushes, Esq. Martin's meadow; 12,600-601, Salem, NY, 14. ix. 1850, on alder bushes, north side of big hill; **1959-63, Salem, NY, 3. viii. 1852, on grass, meadow south of Jarvis Martin's sawmill; *2203, Salem, NY, 20. viii. 1852, on *Solidago* weeds, Esq. Martin's meadow.

Extant Specimens: *6301/Fitch's Type/Fitch's Collection/Type No. 590 (USNM); **1963/Fitch's Type/Fitch's Collection/Type No. 590 (USNM); **2203/Fitch's Type/Fitch's Collection/Type No. 590 (USNM).

Family CIXIIDAE

108. **Cixius coloepeum** Fitch, 1857m:452.

Cixius coloepeum Fitch.

Original Specimens: *6850, Greenwich, NY, 6. vi. 1857, edge of woods north of P. C. Dunlap's.

109. **Cixius pini** Fitch, 1851a:45.

Cixius pini Fitch.

Original Specimens: *2688, Salem, NY, 20. v. 1846, on pine trees, northwest corner of mill lot; 469-474, Winhall, VT, 17. vi. 1847, on spruce and fir trees, near summit of Green Mountains.

Extant Specimens:474/ C. pini/112 (MCZH); 616/Male (NYSM); 617/Female (NYSM).

Family ACHILIDAE

110. **Cixius cinctifrons** Fitch, 1857m:451.

Catonia cinctifrons (Fitch).

Original Specimens:1883, New Brunswick, NJ, 23. ix. 1851, on walnut bushes.

111. **Cixius impunctatus** Fitch, 1851a:46.

Catonia impunctata (Fitch).

Original Specimens:3964, Salem, NY, 22. viii. 1846, on oak bushes, on the ridge of Chester Martin's woodlot; *6031, Salem, NY, 19. viii. 1847, on black oak, Titus's hill; *6179, Salem, NY, 21. viii. 1847, on white pine, near McDougall's Lake.

Extant Specimens:618/Male (NYSM).

Family ISSIDAE

112. **Bruchomorpha dorsata** Fitch, 1857m:396.

Bruchomorpha dorsata Fitch.

Original Specimens:4480, Tullehassie, AR, vi. 1851; 1554-58, Tullehassie, AR, 1. vi. 1851, on grass, from Wm. S. Robertson; 2007-09, 3040-41, Tullehassie, AR, viii. 1851, from Wm. S. Robertson; 4802, Tullehassie, AR, 12. vi. 1852, from Wm. S. Robertson; 4467, Tullehassie, AR, 14. vi. 1852, from Wm. S. Robertson; 5103, Tullehassie, AR, 18. vi. 1852, from Wm. S. Robertson; 5337, Tullehassie, AR, 26. vi. 1852, on grass and bushes, from Wm. S. Robertson; 5444, Tullehassie, AR, 29. vi. 1852, from Wm. S. Robertson; 5820, Tullehassie, AR, vii. 1852, from Wm. S. Robertson; 6206, Tullehassie, AR, 7. vii. 1852, from Wm. S. Robertson; 6400, Park Hill, AR, 30. viii. 1852, from Wm. S. Robertson; 6425-26, Tullehassie, AR, 30. viii. 1852, from Wm. S. Robertson; 6524, Tullehassie, AR, x. 1852, from Wm. S. Robertson; 10,184-185, Tullehassie, AR, 18. v. 1855, from Wm. S. Robertson.

Extant Specimens:1555/118 (MCZH).

113. **Naso robertsonii** Fitch, 1857m:396.

Fitchiella robertsonii (Fitch).

Original Specimens:1775-77, 4479, Tullehassie, AR, vii. 1851, from Wm. S. Robertson; 2010, Tullehassie, AR, viii. 1851, from Wm. S. Robertson; 5443, Tullehassie, AR, 29. vii. 1852, from Wm. S. Robertson; 6450 Tullehassie, AR, x. 1852, from Wm. S. Robertson; 8920, near Keithsburg, IL, 9. x. 1854, swept from grass among timber by Albert Burnett, near Mr. Kimball's.

Extant Specimens:1776/ *Naso robertsonii*/119 (MCZH).

Family PSYLLIDAE

114. **Psylla annulata** Fitch, 1851a:64.

Psylla annulata Fitch.

Original Specimens: *5220-24, Salem, NY, 21. vii. 1847, on sugar maple, border of Esq. Martin's meadow; 13,303-306, Stillwater, NY, vii. 1848?, on oak bushes, west of grandmother's; *9681-82, Salem, NY, 17. vi. 1851, on bushes near McDougall's Lake.

Extant Specimens: *5221/Type No. 1366 (USNM); 13,306 (USNM); *9681/Type No. 1366 (USNM); *9682/Type No. 1366 (USNM).

115. **Diraphia calamorum** Fitch, 1858e:740.

Livia vernalis Fitch.

Original Specimens:7800, New Brunswick, NJ, 15. v. 1854, on *Acorus calamus*, beside Raritan River, two miles below the city.

Extant Specimens:7800/Type No. 1367 (USNM).

Note: A specimens in the USNM collection bears Fitch's label, 15,246, and it is also labelled "Type No. 1367." According to Fitch's specimen registers, this specimen was collected in 1862, and, therefore, it is not part of the original type series.

116. **Psylla carpini** Fitch, 1851a:64.

Psylla carpinicola Crawford.

Original Specimens: *3171, Salem, NY, 3. vii. 1846, on *Carpinus*, in Harvey's meadow; *3640, Salem, NY, 24. vii. 1846, beat from bushes, Jarvis Martin's woods; *3680-85, Salem, NY, 27. vii. 1846, on *Carpinus*, beside the hill in Esq. Martin's meadow; *9219-33, Salem, NY, 30. v. 1851, on *Carpinus*, willows, and weeds, Esq. Martin's meadow; *9680, Salem, NY, 17. vi. 1851, on leaves of bushes by McDougall's Lake.

Extant Specimens: *3640/203 (MCZH); *3681/Type No. 1343 (USNM); *9233/Type No. 1343 (USNM); *9680/Type No. 1343 (USNM).

117. **Livia femoralis** Fitch, 1851a:64.

Livia vernalis Fitch.

Original Specimens:11,875, Salem, NY, 29. vii. 1846, on pine leaves, on top of the dugway hill.

Extant Specimens:Female/838 (USNM).

Note: The number 838 on the above specimen is written in Fitch's handwriting, and it corresponds with the specimen number given in his original description. This specimen is listed as "destroyed" in McCabe and Johnson (*Bull. N. Y. State Museum* 434, 1980).

118. **Chermes laricifoliae** Fitch, 1858e:752.

Original Specimens: *9974-75, Salem, NY, 14. vii. 1851, solitary, on tamarack leaves in the back yard.

119. **Diraphia maculipennis** Fitch, 1858e:740.

Livia maculipennis (Fitch).

Original Specimens:7801-02, New Brunswick, NJ, 15. v. 1854, on *Acorus calamus* growing in vast tracts, beside the Raritan River two miles below the city.

Extant Specimens:7801/7802/Type No. 1344 (USNM, 2 specimens on same pin).

120. **Psylla quadrilineata** Fitch, 1851a:64.

Psylla quadrilineata Fitch.

Original Specimens: *4263, Salem, NY, 4. iii. 1847, on snow, near McDougall's Lake; *8636-38, Salem, NY, 7. v. 1851, on willow in the meadow; *8819-23, Salem, NY, 10. v. 1851, on willow in Esq. Martin's meadow.

Extant Specimens: *8636/Type No. 1342 (USNM); *8637/Type No. 1342 (USNM).

Note: A specimen in the USNM collection bears Fitch's label *8825, and it is also labelled "Type No. 1342." According to Fitch's manuscript notes and specimen registers, he did not consider this specimen to be *P. quadrilineata*, so it cannot be considered a type of this species.

121. **Psylla tripunctata** Fitch, 1851a:64.

Trioza tripunctata (Fitch).

Original Specimens: **350-351, Salem, NY, 28. xi. 1851, on snow, in the wood lot.

Extant Specimens: **350/**351/Type No. 1345 (USNM, two specimens on same pin).

122. **Livia vernalis** Fitch, 1851a:64.

Livia vernalis Fitch.

Original Specimens: *2001-04, Salem, NY, 6. iv. 1846, on the big hill, in sap of the sugar maple; *5341, Salem, NY, 23. vii. 1847, beat from pine leaves, dugway hill; *7294, Salem, NY, 12. v. 1848, on black currant bushes in the meadow; *9896, Salem, NY, 9. vi. 1851, on grass, west border of Jarvis Martin's woods; **5870-73, Salem, NY, 24. ix. 1851, on leaves of pine bushes, Titus's hill.

Extant Specimens: **5870/Type No. 1341 (USNM); **5871/Type No. 1341 (USNM); **5872/Type No. 1341 (USNM); **5873/Type No. 1341 (USNM); Male/836 (USNM).

Note: The number 836 on the above specimen is written in Fitch's handwriting, and it corresponds with the specimen number given in his original description. This specimen is listed as "destroyed" in McCabe and Johnson (*Bull. N. Y. State Museum* 434, 1980).

Family ALEYRODIDAE

123. **Aspidiotus gossypii** Fitch, 1857m:332.

Aleyrodes gossypii (Fitch).

Original Specimens: "Upon the leaves of a dried specimen of the China cotton plant (*Gossypium religiosum*) sent me from Ningpo by Rev. M. S. Culbertson. . . ."

Family APHIDIDAE

124. **Lachnus abietis** Fitch, 1851a:67.

Cinara abietis (Fitch).

Original Specimens:346-47, Stratton, VT, 17. vi. 1847, beat from spruce bushes.

125. **Lachnus alnifoliae** Fitch, 1851a:67.
Pterocallis alnifoliae (Fitch).
 Original Specimens: 12,003-004, Salem, NY, 25. viii. 1846, on alder leaves near the former junction of the creeks in the meadow.
126. **Aphis asclepiadis** Fitch, 1851a:65.
Aphis asclepiadis Fitch.
 Original Specimens: *4500-11, Salem, NY, 25. vi. 1847, on milkweed, back of Josephus Martin's barn, on the young leaves near the top of the stalk, in dense colonies.
 Extant Specimens: *4504/From Fitch Collection/ *Aphis asclepiadis* Fitch/ 9175 (USNM); *4505/From Fitch Collection/ *Aphis asclepiadis* / 9175 (USNM); *4507 / From Fitch Collection/ *Aphis asclepiadis*/9175 (USNM); From Fitch Collection/ *Aphis asclepiadis* Fitch/9175 (USNM).
127. **Aphis berberidis** Fitch, 1851a:65.
Liosomaphis berberidis (Kaltenbach).
 Original Specimens: *4201-02, Salem, NY, xi. 1846, on barberry in back yard; *9143-48, Salem, NY, 28. v. 1851, on barberry in back yard.
 Extant Specimens: 842/ Male (NYSM); 843/Female (NYSM).
 Note: Eleven specimens in the USNM collection are labelled "*Liosomaphis berberidis*, Fitch (Type)." Eight of them lack Fitch's specimen numbers, but the remaining three bear his labels **1130, **1131, and **1133. According to Fitch's specimen registers, these three specimens were collected in 1854, and, therefore, they are not part of the original type series.
128. **Aphis betulaeaccolens** Fitch, 1851a:66.
Calaphis betulaeaccolens (Fitch).
 Original Specimens: 465, Winhall, VT, 17. vi. 1847, near summit of the Green Mountains, on *Viburnum lantanoides* or *acerifolium*; *4860-61, *4937-38, Salem, NY, 5. vii. 1847, on birch, bank of the kill, Esq. Martin's pasture.
 Extant Specimens: 6807, (*Aphis*) *betulaeaccolens*, Fitch (848, Cotype), from Fitch Collection/Remt'd Quednau '70/848/ Birch-inhabiting *Aphis*, *A. betulaeaccolens*, Fh. (USNM).
 Note: The number 848 on the above specimen is written in Fitch's handwriting, and it corresponds with the specimen number given in his original description. This specimen is listed as "destroyed" in McCabe and Johnson (*Bull. N. Y. State Museum* 434, 1980).
129. **Aphis mali bivincta** Fitch, 1855n:760.
 Original Specimens: **4992, Salem, NY, 31. x. 1854.
 Extant Specimens: 9747, *Aphis mali*, var. *bivincta* Fitch, Fitch No. 4992, Mounted by Pergande, Type, A.C.B./A. *mali bivincta*/ **4992 (USNM).
130. **Eriosoma caryae** Fitch, 1857m:443.
Prociphilus caryae (Fitch).
 Original Specimens: 8377, north of Henderson River, IL, 2. x. 1854, on walnut bushes.
 Extant Specimens: 920, P, Type, from old Fitch Collection/ 8377/Illinois (USNM).
131. **Aphis caryella** Fitch, 1855n:867.
Monellia caryella (Fitch).
 Original Specimens: *4735, Salem, NY, 28. vi. 1847, on walnut leaves, border of Jarvis Martin's woods; **1539-49, Salem, NY, 21. vi. 1852, on walnut leaves above red bridge; **1793-94, Salem, NY, 8. vii. 1852, south base of Battle Hill.
 Extant Specimens: **1539/Cotype (USNM); **1540/Type (USNM); **1541/Type (USNM); **1542/Cotype (USNM); **1543/Type (USNM).
132. **Callipterus castaneae** Fitch, 1857m:471.
Calaphis castaneae (Fitch).
 Original Specimens: *4882-87, Salem, NY, 31. viii. 1854, on underside of leaves of chestnut.
133. **Aphis cerasicolens** Fitch, 1851a:65.
Euceraaphis betulae (Koch).
 Original Specimens: *5658-61, Salem, NY, 8. viii. 1847, on black cherry tree, in Esq. Martin's pasture.
 Extant Specimens: Cotype, From Fitch Collection/841/ Cherry-inhabiting *Aphis*, *A. cerasicolens*, Fh. (USNM).
 Note: The number 841 on the above specimen is written in Fitch's handwriting, and it corresponds with the specimen number given in his original description. This specimen is listed as "destroyed" in McCabe and Johnson (*Bull. N. Y. State Museum* 434, 1980).
134. **Aphis cerasifoliae** Fitch, 1855n:835.
Rhopalosiphum cerasifoliae (Fitch).
 Original Specimens: 13. vii. 1855, 31. viii. 1855, undersides of young, tender, apical leaves of chokecherry, beside the railroad in Alexander's (formerly Judge Savage's) meadow.
 Extant Specimens: *Aphis cerasifoliae*, type from the Fitch collection, mounted – Pergande (USNM).
135. **Aphis circeandis** Fitch, 1871:501.
Aphis gossypii Glover.
 Original Specimens: **1319-23, Salem, NY, 11. vi. 1852, on *Galium circeans*, dugway woods.
 Extant Specimens: *Aphis circeandis* (Type)/**1319 (USNM); *Aphis circeandis* (Type)/**1320 (USNM); *Aphis circeandis* (Type)/**1321 (USNM); *Aphis circeandis* (Type)/**1322 (USNM).
136. **Aphis cornifoliae** Fitch, 1851a:65.
Aphis cornifoliae Fitch.
 Original Specimens: *5408-09, Salem, NY, 27. vii. 1847, on *Cornus paniculata*, Esq. Martin's meadow.
 Extant Specimens: 846 Fitch (Type)/Female/Dogwood-leaf *Aphis*, *A. cornifoliae*, Fh. (USNM); *Aphis cornifoliae*, Fitch (Type) on *Cornus paniculata*, New York (USNM).
 Note: The number 846 on the above specimen corresponds with the specimen number given in Fitch's original description. This specimen is listed as "destroyed" in McCabe and Johnson (*Bull. N. Y. State Museum* 434, 1980).
137. **Aphis caryella costalis** Fitch, 1855n:869.
Monellia costalis (Fitch).
 Original Specimens: **1794, Salem, NY, 8. vii. 1852, on walnut leaves, south base of battle hill.
 Extant Specimens: Mounted from the Fitch Coll. by A. C. Baker/**1794/Type (USNM).
138. **Aphis crataegifoliae** Fitch, 1851a:66.
Nearctaphis crataegifoliae (Fitch).
 Original Specimens: 12,319-326, Salem, NY, 3. vi. 1847, common on a bush of *Crataegus punctata* growing in back

- yard; *9283-91, Salem, NY, 2. vi. 1851, upon a shrub of *Crataegus coccinea* growing in the edge of the meadow.
Extant Specimens: *9287/*Aphis crataegifoliae* Fitch, N.Y./206 (MCZH); *Aphis crataegifoliae* Type 9130 (USNM).
139. **Aphis mali fulviventris** Fitch, 1855n:760.
Original Specimens: **5000, Salem, NY, 31. x. 1854.
Extant Specimens: **5000/ *A. mali fulviventris*/mounted by Pergande/Type (USNM).
140. **Aphis fumipennella** Fitch, 1855n:870.
Myzocallis fumipennella (Fitch).
Original Specimens: **1791-92, Salem, NY, 8. vii. 1852, beat from walnut bushes, south base of Battle Hill.
Extant Specimens: *1791 (Type) (USNM).
141. **Brysocrypta hamamelidis** Fitch, 1851a:69.
Hormaphis hamamelidis (Fitch).
Original Specimens: *6194-98, Salem, NY, 21. viii. 1847, near McDougall's Lake; *9683-84, Salem, NY, 7. vi. 1851, at outlet of McDougall's Lake.
Extant Specimens: 869/ Male (NYSM); 870/ Larva (NYSM); 871/Follicle (NYSM).
142. **Eriosoma imbricator** Fitch, 1851a:68.
Fagiphagus imbricator (Fitch).
Original Specimens: 11,979-986, Salem, NY, 22. viii. 1846, woods near McDougall's Lake, on beech twigs and leaves.
Extant Specimens: 864/ Male (NYSM); 865/ Female? (NYSM); 866/Larva (NYSM).
143. **Aphis mali immaculata** Fitch, 1855n:760.
144. **Rhizobius lactucae** Fitch, 1872a:360.
Pemphigus bursarius (Linnaeus).
Extant Specimens: *Rhizobius lactucae*, Fitch (Fitch's label)/Fitch's type mount'd from the Fitch Coll. by Theo. Perg., A. C. B. (USNM).
145. **Lachnus laricifex** Fitch, 1858e:752.
Cinara laricifex (Fitch).
Original Specimens: **930-939, Salem, NY, 17. v. 1852, on tamarack (drooping) in front yard.
146. **Aphis maculella** Fitch, 1855n:870.
Monellia maculella (Fitch).
Original Specimens: **1539, Salem, NY, 21. vi. 1852, on walnut leaves above the red bridge.
147. **Aphis maidis** Fitch, 1856l:550.
Rhopalosiphum maidis (Fitch).
Original Specimens: **375-378, Salem, NY, viii. 1851, gregarious, in a large colony, on the inner side of the pistillate peduncles of the Indian corn; Salem, NY, 20. ix. 1855, on peduncle of corn beside office.
148. **Aphis malifoliae** Fitch, 1855n:760.
Nearctaphis crataegifoliae (Fitch).
Original Specimens: Keithsburg, IL, 4. x. 1854, beat from apple trees, A. Burnett's.
149. **Aphis marginella** Fitch, 1855n:870.
Monellia costalis (Fitch).
Original Specimens: Salem, NY, 8.ix.1855, from pupa on walnut leaves, hatched in office.
150. **Callipterus mucidus** Fitch, 1857m:334.
Euceraphis mucida (Fitch).
Original Specimens: Salem, NY, 5.vi.1856, beat from apple tree in back yard; Salem, NY, 10.vi.1856, flying among bushes in woods by outlet of McDougall's Lake.
Extant Specimens: *Callipterus mucidus*, Fitch, on apple, Type 9315 (USNM, 2 specimens).
151. **Aphis mali nigricollis** Fitch, 1855n:760.
Original Specimens: **4993, Salem, NY, 31.x.1854.
Extant Specimens: 9747. *Aphis mali* var.*nigricollis* Fitch, Fitch No.4993, Mounted by Pergande, Type, A.C.B./ **4993 (USNM).
152. **Aphis mali nigriventris** Fitch, 1855n:760.
Original Specimens: **4997, Salem, NY, 31.x.1854.
Extant Specimens: 9747. *Aphis mali* var.*nigriventris* Fitch, Fitch No.4997, mounted by Pergande, Type, A.C.B./ **4997 (USNM).
153. **Aphis mali obsoleta** Fitch, 1855n:760.
Original Specimens: *4990, Salem, NY, 31.x.1854.
Extant Specimens: 9747. *Aphis mali* var.*obsoleta* Fitch, Fitch No.4990, Mounted by Pergande, Type, A.C.B./ **4990 (USNM).
154. **Aphis mali pallidicornis** Fitch, 1855n:759.
Original Specimens: **4987, Salem, NY, 31.x.1854.
Extant Specimens: 9747. *Aphis mali pallidicornis* Fitch, Fitch No.4987. Mounted by Pergande. Type, A.C.B./ **4987 (USNM).
155. **Aphis pinicolens** Fitch, 1851a:66.
Euceraphis pinicolens (Fitch).
Original Specimens: *4919, Salem, NY, 5.vii.1847, at rest on a white pine bush in the pine woods.
Extant Specimens: 9391, *A. pinicolens*, Fitch. (842) (Cotype) From Fitch Collection/842/Pine-inhabiting *Aphis* (USNM).
Note: According to Fitch's Homoptera catalog, specimen 842 is *Aphis berberidis*.
156. **Pemphigus popularia** Fitch, 1859d:849.
Pemphigus popularis Fitch.
Original Specimens: Salem, NY, 12.x.1855, numerous specimens walking down and up the trunk of the Balm of Gilead in the front yard, and some on the leaves with a species of *Aphis*Save 11 specimens.
157. **Pemphigus populicaulis** Fitch, 1859d:845.
Pemphigus populicaulis Fitch.
Original Specimens: Salem, NY, 27.vi.1856, from galls, Lombard poplar, front yard.
158. **Aphis populifoliae** Fitch, 1851a:66.
Pterocomma populifoliae (Fitch).
Original Specimens: *6118-22, Salem, NY, 19.viii.1847, east of Mrs. Fitch's woods, on *Populus grandidentata*; *9292-9302, Salem, NY, 5.vi.1851, on *Populus grandidentata* twigs, in edge of meadow.
Extant Specimens: 9171, (Type), F. No.9292/*9292 (USNM); 9171, on *Populus grandidentata* (9293, Cotype), from Fitch Collection/ *9293 (USNM); *9294/*Aphis populifoliae* Fitch/208 (MCZH); 9171, (Type), Fitch 9297/*9297 (USNM); 9171, (nymph from apterous type), F9297/*9297

- (USNM); *9298/208A (MCZH): 9171 (Type) F. No.9300/*9300 (USNM); 9171 (Type), Fitch 9301/*9301 (USNM); 9171, (*Aphis*) *populifoliae*, Fitch, on *Populus grandidentata* (Cotypes), from Fitch Collection/Poplar-leaf *Aphis*, *A. populifoliae*, Fh.(USNM).
159. **Pemphigus populiglobuli** Fitch, 1859d:850.
Pemphigus populiglobuli Fitch.
Original Specimens: Salem, NY, 15.vii.1859, in galls on Balsam poplar leaves, from yard.
Extant Specimens: *P. populiglobuli* Fitch, Type, Mounted from Fitch coll.by A.C.Baker (USNM).
160. **Pemphigus populivinae** Fitch, 1859d:851.
Pemphigus populivinae Fitch.
Original Specimens: Salem, NY, 23.vii.1856, in galls on Balsam poplar leaves, in front yard; Salem, NY, 15.vii.1859, in galls on Balsam poplar leaves, in front yard.
Extant Specimens: *P. populivinae* Fitch. Mounted from the Fitch Coll.by A.C.Baker, Type (USNM).
161. **Aphis prunifoliae** Fitch, 1855n:826.
Rhopalosiphum padi (Linnaeus).
Original Specimens: **3772-83, Greenwich, NY, 29.v.1854, on plum trees (**3780-82, variety c; *3778, *3781, variety d; *3776, variety e; *3773, variety f; *3775, variety g).
Extant Specimens: 9752, (Type)/*Aphis prunifoliae*, Fitch/a (USNM); 9752 (*Aphis*) *prunifoliae*, Fitch (Type), Fitch d/d (USNM); 9752, (*Aphis*) *prunifoliae*, Fitch (Type), Fitch (e)/e (USNM); 9752, (*Aphis*) *prunifoliae*, Fitch (Type), Fitch (f)/f (USNM); 9752, (*Aphis*) *prunifoliae*, Fitch (Type)/g (USNM).
162. **Aphis punctatella** Fitch, 1855n:869.
Myzocallis punctatella (Fitch).
Original Specimens: **1537-38, Salem, NY, 21.vi.1852, on walnut leaves, above the red bridge.
Extant Specimens: 1537, Fitch, on hickory (Type), Fitch No.1537, **1537 (USNM).
163. **Eriosoma pyri** Fitch, 1851a:68.
Prociphilus caryae fitchii Baker and Davidson.
Original Specimens: *4053-54, Salem, NY, 10.xi.1846; 13,254-258, Glens Falls, NY, 29.x.1849, on apple-tree roots, from nursery.
Extant Specimens: *4053, *Eriosoma pyri* Fitch/218 (MCZH); *4054/218A (MCZH); (F 13,255) (Type)/13,255 (USNM); (Type), (Fitch) collection (USNM); Male (NYSM); 862 (NYSM).
164. **Eriosoma querci** Fitch, 1859d:804.
Anoecia querci (Fitch).
Original Specimens: 7946-49, Ottawa, IL, 16.x.1854, beat from oaks, south of Covill Creek; 7950-51, Ottawa, IL, 16.x.1854, swept from grass, south of Covill Creek.
Extant Specimens: Type!, from Fitch Collection (No.7948) (of Fitch)/2912 (USNM); Mounted from the Fitch Collection by A.C.Baker, Fitch No.7949, *querci* – Cotype (USNM); Mounted from the Fitch Collection by A.C.Baker, Fitch No.7950, *querci* – Cotype (USNM); Mounted from the Fitch Collection by A.C.Baker, Fitch No.7951, *querci* – Cotype (USNM).
165. **Lachnus quercifoliae** Fitch, 1851a:67.
Chaitophorus quercifoliae (Fitch).
Original Specimens: *4841-42, *4935-36, Salem, NY, 5.vii.1847, on a white oak tree, in Esq.Martin's pasture.
166. **Byrosocrypta rhois** Fitch, 1866f:73.
Melaphis rhois (Fitch).
Original Specimens: Salem, NY, 8.vii.1854, on young sumach in front yard.
167. **Aphis rudbeckiae** Fitch, 1851a:66.
Dactynotus rudbeckiae (Fitch).
Original Specimens: 11,715-720, Salem, NY, 13.vii.1846, on *Solidago serotina*, *S. gigantea*, and *S. altissima* growing in the meadow; 12,676-679, Salem, NY, viii.1850, on stalks of *Rudbeckia laciniata*.
Extant Specimens: 11,715, *Aphis rudbeckiae* Fitch/207 (MCZH); 11,717/207A (MCZH); Male (NYSM); 853 (NYSM).
Note: Four specimens in the USNM collection bear Fitch's labels **4282-85, and they are also labelled "Type." According to Fitch's specimen registers, these specimens were collected in 1854, and, therefore, they are not part of the original type series.
168. **Lachnus salicellis** Fitch, 1851a:67.
Chaitophorus salicellis (Fitch).
Original Specimens: 11,721-724, Salem, NY, 13.vii.1846, from the willow tree supporting the foot-bridge over White Creek.
Extant Specimens: 9392, (*Lachnus*) *salicellis*, Fitch (856), Cotype, From Fitch Collection/958/Willow *Lachnus* (USNM).
169. **Aphis sambucifoliae** Fitch, 1851a:66.
Aphis sambuci Linnaeus.
Original Specimens: *5085-86, Saratoga Springs, NY, 15.vii.1847, on the underside of leaves of the elder (?).
Extant Specimens: 9395, *Aphis sambucifoliae* Fitch (850; Cotype), From Fitch Collection/850/Elder-leaf *Aphis* (USNM).
Note: The number 850 on the above specimen corresponds with the specimen number given in Fitch's original description. This specimen is listed as "destroyed" in McCabe and Johnson (*Bull. N. Y. State Museum* 434, 1980).
170. **Eriosoma strobili** Fitch, 1851a:69.
Cinara strobili (Fitch).
Original Specimens: *3094-96, Salem, NY, 24.vi.1846, on white pine on big hill; *4862, Salem, NY, 5.vii.1847, bank of the kill, on birch tree, where it had probably come from an adjoining much infested pine.
Extant Specimens: *Cinara strobili* (Fitch), Det.Feb. 1966/by Pepper and Tissot, Accepted as type of *strobili* (Fitch) (USNM); *Eriosoma strobili* Fitch, Metatype, Mounted from the Fitch coll.by Pergande, A.C.B./Pine-tree blight (USNM).
171. **Aphis mali tergata** Fitch, 1855n:760.
Original Specimens: **4994, Salem, NY, 31.ix.1854.
Extant Specimens: 9747, *Aphis mali* var.*tergata* Fitch, Fitch No.4994, mounted by Pergande, Type, A.C.B./**4994 (USNM).

172. **Eriosoma tessellata** Fitch, 1851a:68.
Prociphilus tessellatus (Fitch).
 Original Specimens: 12,001-002, Salem, NY, 25.viii.1846, from alders where Black and White Creeks formerly united in the meadow.
 Extant Specimens: 863 (NYSM); Female?(NYSM).
173. **Aphis mali thoracica** Fitch, 1855n:760.
 Original Specimens: **4995, Salem, NY, 31.x.1854.
 Extant Specimens: 9749, *Aphis mali* var. *thoracica* Fitch, Fitch No.4995, Mounted by Pergande, Type, A.C.B./ **4995 (USNM).
174. **Aphis mali triseriata** Fitch, 1855n:760.
 Original Specimens: **4988, Salem, NY, 31.x.1854.
 Extant Specimens: 9747, *Aphis mali* var. *triseriata* Fitch, F. No.4988, Mounted by Pergande, Type, A.C.B./ **4988 (USNM).
175. **Byrsocrypta ulmicola** Fitch, 1859d:843.
Colopha ulmicola (Fitch).
 Original Specimens **9687-88, Salem, NY, 17.vi.1851, near outlet of McDougall's Lake; Salem, NY, 20.vii.1859, dead, gall, on elm leaf in front yard.

Family ADELGIDAE

176. **Coccus pinicorticis** Fitch, 1855n:871.
Pineus strobus (Hartig).
 Original Specimens: Fort Miller, NY, 1852, on young pines, in John Pattison's yard; Salem, NY, 13.xi.1854, on the young pine, south side of my house.
177. **Chermes pinifoliae** Fitch, 1858e:741.
Pineus pinifoliae (Fitch).
 Original Specimens: **946-48, Salem, NY, 16.v.1852, on white pine, in the front yard; **940-945, Salem, NY, 22.v.1852, on white pine, in the front yard.

Family PHYLLOXERIDAE

178. **Pemphigus caryaecaulis** Fitch, 1855n:859.
Phylloxera caryaecaulis (Fitch).
179. **Phylloxera caryaefoliae** Fitch, 1857m:446.
Paramoritzia caryaefoliae (Fitch).
 Original Specimens: **1520-32, Salem, NY, 21.vi.1852, on walnut leaves above red bridge.
180. **Pemphigus(?) caryaevenae** Fitch, 1857m:444.
Phylloxera caryaevenae (Fitch).
 Original Specimens: 2.ix.1855, in hickory leaves, plaits formed by a louse.
181. **Pemphigus vitifoliae** Fitch, 1855n:862.
Daktulosphaira vitifoliae (Fitch).
 Original Specimens: 11.vi.1855, in small red and yellow galls scarcely the size of a pea, on the margin of leaves of the grapevine.

Family DIASPIDIDAE

182. **Aspidiotus cerasi** Fitch, 1857m:368.
Chionaspis furfura (Fitch).

Original Specimens: 14.ii.1857, on limbs of chokecherry bushes.

Extant Specimens: Cherry scale insect, *Aspidiotus cerasi* Coll.N.Y.State Agric.Soc.(NYSM).

183. **Aspidiotus circularis** Fitch, 1857m:426.
 Original Specimens: 14,221, Albany, NY, 14.iv.1856, on currant in Mr.Orcutt's garden.
 Extant Specimens: *A.circularis*, Fitch MSS, (Type) (USNM).
184. **Aspidiotus furfurus** Fitch, 1857m:352.
Chionaspis furfura (Fitch).
 Original Specimens: *1915-18, Jacksonville, IL, from Prof. B.Turner, pr.B.P.Johnson; *1919-21, Jacksonville, IL, from Prof.B.Turner (showing scurf on bark); *1922-26, Jacksonville, IL, from Prof.B.Turner, pr.J.J.Thomas.
 Extant Specimens: Scurfy Bark Louse, *Aspidiotus furfurus*/Coll.N.Y.State Agric.Soc.(NYSM).
185. **Aspidiotus juglandis** Fitch, 1855n:739.
Lepidosaphes ulmi (Linnaeus).
 Original Specimens: Salem, NY, 31.v.1854, on a butter-nut twig, Chester Martin's meadow.
186. **Aspidiotus pinifoliae** Fitch, 1856l:488.
Phenacaspis pinifoliae (Fitch).
 Original Specimens: *450-53, Springfield, IL, 5.ix.1855, from Robert W.Kennicott, leaves of his white pines.
 Extant Specimens: Pine-leaf Scale-insect, *Aspidiotus pinifoliae*, Coll.N.Y.State Agric.Soc.(NYSM).
- Family COCCIDAE
187. **Lecanium acericorticis** Fitch, 1860o:22.
Pulvinaria vitis (Linnaeus).
 Original Specimens: **3786, Salem, NY, 1.vi.1854, on a maple, west border of Jarvis Martin's woods; 15.v.1855, twenty specimens taken from a maple twig.
188. **Lecanium caryae** Fitch, 1857m:443.
Eulecanium caryae (Fitch).
 Original Specimens: *3723-37, Salem, NY, 1.vi.1854, from twigs of a walnut, west side of Jarvis Martin's woods.
 Extant Specimens: *Lecanium caryae*, Fitch/**3735 (USNM); Hickory Scale-insect, and its chalk-mark on the bark, *Lecanium caryae*/Coll.N.Y.State Agric.Soc.(NYSM).
189. **Lecanium cerasifex** Fitch, 1857m:368.
Parthenolecanium cerasifex (Fitch).
 Original Specimens: **4126, Salem, NY, 12.vi.1854, on a small limb of the wild black cherry.
 Extant Specimens: *Lecanium cerasifex*, Fh./**4126 (USNM).
190. **Lecanium corylifex** Fitch, 1857m:473.
Parthenolecanium corni (Bouché).
 Original Specimens: **1449, **1452, **1459, **1461-62, **1465-69, **1475, Salem, NY, 31.v.1854, on underside of hazelnut twigs, Chester Martin's meadow.
 Extant Specimens: On Hazel (*Corylus*), Salem, N.Y., Dr.A.Fitch, May 31, 1854, Fitch Coll., Type (USNM).
191. **Lecanium cynosbati** Fitch, 1857m:436.
Parthenolecanium corni (Bouché).

Original Specimens: **1824, Salem, NY, 1.vi.1854, upon a small bunch of wild gooseberry, growing by the brook, west of Jarvis Martin's woods.

Extant Specimens: On Gooseberry, Salem, N.Y.(#1824), June 1, 1854, Fitch Coll., Type (USNM).

192. **Lecanium juglandifex** Fitch, 1857m:463.

Parthenolecanium corni (Bouché).

Original Specimens: **1476-80, Salem, NY, 31.v.1854, from a butternut in Chester Martin's meadow; **3883-90, **3896, Salem, NY, 7.vi.1854, on butternut.

193. **Lecanium quercifex** Fitch, 1859d:805.

Parthenolecanium quercifex (Fitch).

Original Specimens: *3784-85, Salem, NY, 29.vii.1846, on white oak leaves, on dugway hill; **3738-42, Salem, NY, 1.vi.1854, from a young white oak, northwest corner of mill lot.

Extant Specimens: White-oak Scale-insect/Coll.N.Y. State Agric.Soc.(NYSM).

194. **Lecanium quercitronis** Fitch, 1859d:805.

Parthenolecanium quercifex (Fitch).

Original Specimens: **3743-69, Salem, NY, 1.vi.1854, on black oak along west margin of Jarvis Martin's woods.

Extant Specimens: Quercitron Scale-insect, *Lecanium quercitronis*/Coll.N.Y. State Agric.Soc.(NYSM).

195. **Lecanium ribis** Fitch, 1857m:427.

Parthenolecanium corni (Bouché).

Original Specimens: Albany, NY, 14.iv.1856, currant bushes in Mr.Orcutt's garden.

196. **Coccus salicis** Fitch, 1851a:69.

Pulvinaria vitis (Linnaeus).

Original Specimens: *3376-77, Salem, NY, 13.vii.1846, at the footbridge.

Extant Specimens: 873/Coll.N.Y.State Agric. Soc. (NYSM).

197. **Coccus tiliae** Fitch, 1851a:69.

Parthenolecanium corni (Bouché).

Original Specimens: *3378-79, Salem, NY, 13.vii.1846, near the footbridge in the meadow.

Family ANTHOCORIDAE

198. **Anthocoris pseudochinche** Fitch, 1856l:527.

Triphleps insidiosa (Say).

Original Specimens: 8395, Keithsburg, IL, 2.x.1854, on ash bushes, beside north side of Henderson River; 8434, Keithsburg, IL, 2.x.1854, on aster flowers, north side of Henderson River; 10,230, Geneva, WI, 9.vii.1855, from Mr.Williams.

Extant Specimens: 10,230/8434/8395/Type No.1139, USNM/*Anthocoris pseudochinche*, Wisconsin (USNM, 3 specimens on one pin).

199. **Anthocoris pseudochinche semiclarus** Fitch, 1856l:527.

Original Specimens: 8394, Keithsburg, IL, 2.x.1854, on ash bushes, north side of Henderson River; 8952, IL, 9.x.1854, on burr oaks by Pope's River.

Family TINGIDAE

200. **Tingis cydoniae** Fitch, 1861o:114.

Corythucha cydoniae (Fitch).

Extant Specimens: Fitch's Collection/*Tingis cydoniae*, Fh.(USNM).

201. **Tingis juglandis** Fitch, 1857m:466.

Corythucha juglandis (Fitch).

Original Specimens: 5600-03, Stillwater, NY, 28.vi.1836, along Schuyler's Brook on butternut bushes; 10,208-212, Salem, NY, 16.v.1845, on *Veratrum* leaves, Josephus Martin's meadow; *2851, Granville, NY, 11.vi.1846, on black birch; *2980-81, Jackson, NY, 16.vi.1846, on white birch, beside the kill; *3002, Salem, NY, vi.1846; *3188-89, Salem, NY, 3.vii.1846, in Harvey's meadow, on the butternut; 11,900, *3861, Salem, NY, 6.viii.1846, on basswood near footbridge in the meadow; *4010-11, Greenwich, NY, 24.viii.1846, on butternut, near P.C.Dunlap's; 12,480-481, Dresden, NY, 10.vi.1847, near the summit of Black Mountain; *5246, Salem, NY, 21.vii.1847, on sumach, Sidney Martin's meadow; *5595, Salem, NY, 29.vii.1847, on *Cornus paniculata*, north side of Black Creek; *6332-33, Salem, NY, 10.ix.1847, on willows in Esq.Martin's meadow; *6980-84, Long Island, NY, 1847, from Wm.S.Robertson, *9248-49, Salem, NY, 30.v.1851, on weeds, Esq.Martin's meadow; **1224-26, Salem, NY, 26.v.1852, on butternut, Esq.Martin's meadow; **1482-84, Salem, NY, 21.v.1854, on butternut, Chester Martin's meadow; 9241, IL, 6.x.1854, on grapevine, along Henderson River.

Extant Specimens: **1224/Fitch's Type/**1226/*Tingis juglandis*, Fitch/Type No.1020 (USNM, 2 specimens on one pin).

Family LYGAEIDAE

202. **Micropus leucopterus albivenosus** Fitch, 1856l:523.

Blissus leucopterus albivenosus (Fitch).

203. **Micropus leucopterus apterus** Fitch, 1856l:523.

Blissus leucopterus apterus (Fitch).

204. **Micropus leucopterus basalis** Fitch, 1856l:523.

Blissus leucopterus basalis (Fitch).

205. **Micropus leucopterus dimidiatus** Fitch, 1856l:523.

Blissus leucopterus dimidiatus (Fitch).

206. **Micropus leucopterus femoratus** Fitch, 1856l:523.

Blissus leucopterus femoratus (Fitch).

207. **Micropus leucopterus fulvivenosus** Fitch, 1856l:523.

Blissus leucopterus fulvivenosus (Fitch).

208. **Micropus leucopterus immarginatus** Fitch, 1856l:522.

Blissus leucopterus immarginatus (Fitch).

209. **Micropus leucopterus nigricornis** Fitch, 1856l:523.

Blissus leucopterus nigricornis (Fitch).

210. **Micropus leucopterus rufipedis** Fitch, 1856l:523.

Blissus leucopterus rufipedis (Fitch).

Family PENTATOMIDAE

211. **Arma bracteata** Fitch, 1857m:336.

Apateticus bracteatus (Fitch).

Extant Specimens: Fitch's Type/Fitch's Collection/ 15,353 (USNM).

Order THYSANOPTERA

Family AEOLOTHRIPIDAE

212. **Coleothrips trifasciata** Fitch, 1855h:385.
Aeolothrips fasciatus (Linnaeus).

Family THRIPIDAE

213. **Thrips tritici** Fitch, 1855h:385.
Frankliniella tritici (Fitch).

Family PHLAEOTHRIPIDAE

214. **Phlaeothrips caryae** Fitch, 1857m:445.
Liothrips caryae (Fitch).
215. **Phlaeothrips mali** Fitch, 1855n:806.
Haplothrips mali (Fitch).

Order NEUROPTERA

Family CONIOPTERYGIDAE

216. **Aleuronia westwoodii** Fitch, 1855n:802.
Malacomyza westwoodii (Fitch).
Original Specimens: 11,624, Salem, NY, 11.vii.1846, edge of Mrs.Fitch's woods, on hazel leaf; 11,874, Salem, NY, 29.vii.1846, beat from pine(?) bushes, on dugway hill; *4600, Salem, NY, 26.vi.1847, in front yard or in office; **4390, Salem, NY, 6.vii.1854, beat from apple trees, Jarvis Martin's orchard; Salem, NY, 5.vi.1855, flying, at sunset, at the meadow gate.

Family HEMEROBIIDAE

217. **Hemerobius alternatus** Fitch, 1855n:797.
Wesmaelius longifrons (Walker).
Original Specimens: *3107, Salem, NY, 26.vi.1846, beat from trees in Jarvis Martin's woods; *4661, Salem, NY, 28.vi.1847, on walnut, west border of Jarvis Martin's woods; *4682-86, Salem, NY, 28.vi.1847, on hemlock and pine bushes, west border of Jarvis Martin's woods.
Extant Specimens: *3107/Type 10451/*Hemerobius alternatus* (MCZ); *4682/Fitch Collection/*Hemerobius alternatus* (USNM); *4685, Fitch Collection/*H.altern.*var.a (USNM).
218. **Hemerobius amicus** Fitch, 1855n:799.
Symphorobius amicus (Fitch).
Original Specimens: *2131, Salem, NY, 20.viii.1852, on basswood bush, Esq.Martin's meadow; **3964, Salem, NY, 30.v.1854, about the house; 9085, IL, 7.x.1854, beat from peach trees, Burnett's.
Extant Specimens: **3964/Type 10449/*Hemerobius amicus* (MCZ); 9085/Fitch Collection/*Hem.amic.*var.a (USNM).
219. **Hemerobius castaneae** Fitch, 1855n:798.
Hemerobius humulinus Linnaeus.
Original Specimens: *729-36, Salem, NY, 26.iv.1845, resting on pine leaves, Jarvis Martin's woods; *915, Salem, NY, 5.v.1845, on the wing by pine leaves, Jarvis Martin's woods;

*3498, Stillwater, NY, 16.vii.1846, on chestnut bushes, west of grandmother's; *3991, Greenwich, NY, 24.viii.1846, on chestnut trees, near P.C.Dunlap's; *6095, Salem, NY, 19.viii.1847, on chestnut bushes, east side of Mrs.Fitch's woods; *7886, Salem, NY, 25.vii.1848, on willows, Esq.Martin's meadow; **2129-30, Salem, NY, 20.viii.1852, on basswood leaves, Esq.Martin's meadow; *2158, Salem, NY, 20.viii.1852, on pig walnut leaves, Esq.Martin's meadow; Salem, NY, 31.viii.1854, beat from chestnut leaves, north of Jarvis Martin's woods; 9607-08, IL, 20.ix.1854, beat from bushes, two miles south of the city of Chicago; 8362, Mercer Co., IL, 2.x.1854, on bushes along Henderson River; 8178, Mercer Co., IL, 2.x.1854, beat from apple trees, Burnett's.

Extant Specimens: Type 18453/*Hemerobius castaneae* (MCZ).

Note: Fitch's specimen 9608, in the MCZ collection, has been considered a type of *Hemerobius tutatrix* Fitch.

220. **Hemerobius conjunctus** Fitch, 1855n:798.
Hemerobius conjunctus Fitch.
Original Specimens: *2689, Salem, NY, 20.v.1846, beat from pine bushes, northwest corner of farm.
Extant Specimens: *2689/Type 10455/*Hemerobius conjunctus* (MCZ).
221. **Hemerobius delicatulus** Fitch, 1855n:800.
Psectra diptera (Burmeister).
Original Specimens: 8200, IL, 4.x.1854, swept from prairie grass, by Burnett's.
Extant Specimens: 8200/Type 10450/*Hemerobius delicatulus*, Illinois (MCZ).
222. **Hemerobius hyalinatus** Fitch, 1855n:799.
Hemerobius conjunctus pinidum Fitch.
Original Specimens: *3796, Salem, NY, 29.vii.1846, on pine leaves, dugway woods; *8808, Salem, NY, 10.v.1851, on pine leaves, west border of Jarvis Martin's woods.
Extant Specimens: *3796, Fitch Collection, *Hem. hyalin.*var.a/*Hemerobius hyalinatus* Fitch (USNM); *8808/Type 10457/*Hemerobius hyalinatus* (MCZ).
223. **Hemerobius occidentalis** Fitch, 1855n:799.
Symphorobius occidentalis (Fitch).
Original Specimens: 8392, IL, 2.x.1854, on ash leaves, beside Henderson River.
224. **Hemerobius pinidum** Fitch, 1855n:799.
Hemerobius conjunctus pinidum Fitch.
Original Specimens: *3795, Salem, NY, 29.vii.1846, on pines, dugway woods; 12,337-338, Salem, NY, 1.vi.1847, on the wing among pine bushes in the pine woods; *7560, Salem, NY, 26.v.1848, on pines, northwest corner of my farm; 13,142, Salem, NY, 1850.
Extant Specimens: 12,338/Type 10456 (MCZ).
225. **Hemerobius stephensii** Fitch, 1855n:797.
Hemerobius stigma Stephens.
Note: Fitch proposed *Hemerobius stephensii* as a replacement name for *H. irroratus* Stephens, which is preoccupied by *irroratus* Say.
226. **Hemerobius stigmaterus** Fitch, 1855n:797.
Hemerobius stigmaterus Fitch.

- Original Specimens: Greenwich, NY, 8.iv.1830, on pine tree in a swampy grove; 1545, Stillwater, NY, 4.v.1837, among pine bushes, by Wilbur's basin; 10,076, Jackson, NY, 30.iii.1845, on hemlock bushes, above red bridge, 10,110, Salem, NY, 12.iv.1845, on window of my room; *6523, Salem, NY, 11.ix.1847, on willows, Esq. Martin's meadow; **4362, Salem, NY, 4.vii.1854, swept from marshy grass in meadow; 9609-11, IL, 20.ix.1854, beat from bushes, two miles south of the city of Chicago; 8360-61, Mercer Co., IL, 2.x.1854, on bushes, north side of Henderson River; 8384-85, Mercer Co., IL, 2.x.1854, on walnut bushes, north side of Henderson River; 8390-91, Mercer Co., IL, 2.x.1854, on ash bushes, north side of Henderson River; 8415, Mercer Co., IL, 2.x.1854, on hazelnut bushes, north side of Henderson River; 8520-21, Mercer Co., IL, 2.x.1854, swept from grass on prairies; 9084, Mercer Co., IL, 7.x.1854, beat from peach leaves; 8179, Mercer Co., IL, 4.x.1854, beat from apple leaves, Burnett's.
- Extant Specimens: 10,110/Type/*H.stig.var.c* (MCZ); *6523/Type/*H.stigma.var.a* (MCZ); *8384/Type 10452/ *Hemerobius stigmaterus* (MCZ); 8391/Type/*H.stig.var.b* (MCZ).
227. **Hemerobius tutatrix** Fitch, 1855n:798.
Hemerobius humulinus Linnaeus.
Original Specimens: 12,059, Greenwich, NY, 26.ix.1846, on the wing about P.C. Dunlap's apple trees; 13,141, Salem, NY, 1850; Salem, NY, 3.ix.1855, in front yard, flying.
Extant Specimens: 9608/Collection Fitch, Fitch's Type (USNM); Type 10454/*H.tutatrix* (MCZ).
Note: According to Dr. Fitch's specimen registers and manuscript species notes, specimen 9608 is *Hemerobius castaneae* Fitch.
- Family CHRYSOPIDAE**
228. **Chrysopa albicornis** Fitch, 1855n:788.
Chrysopa oculata Say.
Original Specimens: 4116-17, Jackson, MS, iv.1852, from Sara E. Fitch.
Extant Specimens: Type 10481/*Chrysopa albicornis*, Mississippi, S.E.F./4116 (MCZ).
229. **Chrysopa bipunctata** Fitch, 1855n:791.
Chrysopa oculata Say.
Original Specimens: 12,335, Salem, NY, 3.vi.1847, on the wing, roadside above the dugway hill.
Extant Specimens: 12,335/*Chrysopa bipunctata*/Type 10482 (MCZ).
230. **Chrysopa chi** Fitch, 1855n:791.
Chrysopa chi Fitch.
Original Specimens: *9788, Hartford, NY, 27.vi.1851, on weeds in the big swamp.
Extant Specimens: *9788/*Chrysopa chi*/Type 10484 (MCZ).
231. **Chrysopa colon** Fitch, 1855n:792.
Chrysopa nigricornis (Burmeister).
Original Specimens: 10,445, Salem, NY, 5.vi.1845, weeds, east end of Battle Hill.
Extant Specimens: 10,445/*Chrysopa colon*/Type 10488 (MCZ).
232. **Chrysopa emuncta** Fitch, 1855n:792.
Meleoma emuncta (Fitch).
Original Specimens: *6010, Salem, NY, 19.viii.1847, beat from white oak, by Jas. Conner's.
Extant Specimens: *6010/*Chrysopa emuncta*/Type 10492 (MCZ).
233. **Chrysopa filicornis** Fitch, 1855n:795.
Original Specimens: Society Islands, Pacific Ocean, from Lieut. Pattison, U.S. Navy.
234. **Chrysopa fulvibucca** Fitch, 1855n:790.
Chrysopa oculata Say.
Original Specimens: Salem, NY, 10.viii.1854, in the office, in the evening.
235. **Chrysopa harrisii** Fitch, 1855n:794.
Chrysopa harrisii Fitch.
Original Specimens: 12,327-334, Stillwater, NY, 16.vii.1846, on the leaves of the pitch pine bushes west of the road past grandmother's and towards the sand hills.
Extant Specimens: 12,329/*Chrysopa harrisii*/Type 10494 (MCZ).
236. **Chrysopa illepida** Fitch, 1855n:788.
Chrysopa oculata Say.
Original Specimens: 7898, Ottawa, IL, 1854, from Dr. Harris; **5532, East Greenwich, NY, 26.vi.1855, in Wm. R. Watson's garden, at dusk.
Extant Specimens: **5532/*Chrysopa illepida*, female/Type 10483 (MCZ).
237. **Chrysopa lineaticornis** Fitch, 1855n:795.
Chrysopa lineaticornis Fitch.
Original Specimens: *5132, Stillwater, NY, 15.vii.1847, on oak leaves.
Extant Specimens: *5132/*Chrysopa lineaticornis*/Type 10489 (MCZ).
238. **Chrysopa mississippiensis** Fitch, 1855n:790.
Chrysopa oculata Say.
Original Specimens: 4118, Jackson, MS, iv.1852, from Sara E. Fitch.
Extant Specimens: 4118/*Chrysopa mississippiensis*, Mississippi, S.E.F./Type 10486 (MCZ).
239. **Chrysopa novaeboracensis** Fitch, 1855n:794.
Chrysopa rufilabris Burmeister.
Original Specimens: Salem, NY, 19.vii.1854, flew in at open window, evening; Salem, NY, 25.vi.1855, flying among grass in front yard, at dusk; Salem, NY, 28.vi.1855, flying among grass in front yard; Salem, NY, 28.vi.1855, flying among grass near Jarvis Martin's.
Extant Specimens: *Chrysopa novaeboracensis*/Type 10490 (MCZ).
240. **Chrysopa omikron** Fitch, 1855n:789.
Chrysopa oculata Say.
Original Specimens: 10,093, Stillwater, NY, 14.vi.1837; 8381, Salem, NY, 17.vi.1844, attracted by lamp, in evening, dugway woods; **4962, Salem, NY, 8.ix.1854, attracted into house by candle, evening; **8497-99, Salem, NY, 18.vi.1855, flying about pines, dugway woods; **5529-31, East Greenwich, NY, 26.vi.1855, in Wm. B. Watson's garden

- at dusk; Salem, NY, 1.vii.1855, on grass in the back yard; Salem, NY, 20.viii.1855, in front yard; Salem, NY, 22.viii.1855, in front yard.
Extant Specimens: 8381/Collection Fitch (USNM); **4962/*Chrysopa omikroni*/Type 10480 (MCZ); **5530/Collection Fitch (USNM).
Note: A specimen in the USNM collection bears Fitch's label **8167. According to Fitch's specimen registers, this specimen was collected in 1858, and, therefore, it is not part of the original type series.
241. ***Chrysopa plorabunda*** Fitch, 1855n:792.
Chrysopa plorabunda Fitch.
Original Specimens: 13,963, Salem, NY, 20.x.1853, on garret window; 9615, IL, 20.ix.1854, on bushes, two miles south of the city of Chicago; 9409, Mercer Co., IL, 27.ix.1854; 8359, Mercer Co., IL, 2.x.1854, on bushes by Henderson River; 8383, Mercer Co., IL, 2.x.1854, on walnut bushes by Henderson River; 8457, Mercer Co., IL, 2.x.1854, on *Solidago* weeds by Henderson River; 8201, Mercer Co., IL, 4.x.1854, on grass along Duck Creek; 8158-72, Mercer Co., IL, 4.x.1854, beat from apple trees, Burnett's farm; 8592-94, Mercer Co., IL, 6.x.1854, swept from clover, Burnett's farm; 9151-52, Mercer Co., IL, on weeds, timber along Henderson River; 9265, Mercer Co. IL, 6.x.1854, on oak bushes along Henderson River; 9080-83, Mercer Co., IL, 7.x.1854, beat from peach trees, Burnett's farm.
Extant Specimens: 8592/*Chrysopa plorabunda*/Type 10493 (MCZ); 8170/*Chr. plorab.*/Type 10496 (MCZ).
Note: Fitch's specimen 8170, in the MCZ collection, has been considered a type of *Chrysopa pseudographa*.
242. ***Chrysopa pseudographa*** Fitch, 1855n:793.
Chrysopa plorabunda Fitch.
Original Specimens: 8173-77, Mercer Co., IL, 4.x.1854, beat from apple trees, A.Burnett's; 9150, Mercer Co., IL, 6.x.1854, beat from weeds, in woods along Henderson River; 9083, Mercer Co., IL, 7.x.1854, beat from peach trees, A.Burnett's.
Note: A specimen in the MCZ collection bears Fitch's label 8170, and it is considered the type of *Chrysopa pseudographa*. According to Fitch's manuscript notes, he considered specimen 8170 to be *Chrosopa plorabunda*, so this specimen cannot be considered the type.
243. ***Chrysopa puncticornis*** Fitch, 1855n:796.
Chrysopa lineaticornis Fitch.
Original Specimens: *5131, Stillwater, NY, 15.vii.1847, on oak leaves.
244. ***Chrysopa robertsonii*** Fitch, 1855n:792.
Chrysopa plorabunda Fitch.
Original Specimens: Tullehassie, AR, 13.v.1855, from Wm.S.Robertson.
Extant Specimens: *Chrysopa robertsonii*, Arkansas/Type 10495 (MCZ).
245. ***Chrysopa sichelii*** Fitch, 1855n:793.
Chrysopa quadripunctata Burmeister.
Original Specimens: Salem, NY, 1.viii.1855, on leaves of elm tree in front yard; Salem, NY, 14.viii.1855, flying in front yard, about an *Aphis*-infested Balm of Gilead, at midnight.
Extant Specimens: *Chrysopa sichelii*/Type 10491 (MCZ).
246. ***Meleoma signoretii*** Fitch, 1855n:786.
Meleoma signoretii Fitch.
Original Specimens: 521, Rupert, VT, 20.vii.1848, on Mt.Antonio, near its summit.
Extant Specimens: 521/Fitch Collection/*Meleoma signoretii* Fitch, Vermont/det.C.Tauber '68 (USNM).
247. ***Chrysopa sulphurea*** Fitch, 1855n:793.
Chrysopa quadripunctata Burmeister.
Original Specimens: 1940, New Brunswick, NJ, 23.ix.1851, beat from walnut bushes.
248. ***Chrysopa tabida*** Fitch, 1855n:796.
Chrysopa interrupta Schneider.
Original Specimens: Salem, NY, 2.viii.1855, on locust leaves in front yard.
249. ***Chrysopa upsilon*** Fitch, 1855n:791.
Chrysopa chi Fitch.
Original Specimens: 10,409, Salem, NY, 4.vi.1845, in Chester Martin's meadow.
Extant Specimens: 10,409/*Chrysopa upsilon*/Type 10485 (MCZ).
250. ***Chrysopa virginica*** Fitch, 1855n:795.
Allochrysa virginica (Fitch).
Original Specimens: 698-99, Cartersville, VA, winter 1847-1848, from Thaddeus A.Culbertson.
251. ***Chrysopa xanthocephala*** Fitch, 1855n:789.
Chrysopa oculata Say.
Original Specimens: 10,384, Salem, NY, 2.vi.1845, in meadow above White Creek; 12,510, Salem, NY, 21.vi.1847, in the front yard; 12,747, Canajoharie, NY, from Wm.S. Robertson; 9967, North Cannon, Kent Co., MI, from T.E. Wetmore.
Extant Specimens: *C.xanthocephala*/Type 10487 (MCZ).

Order COLEOPTERA

Family CICINDELIDAE

252. ***Cicindela johnsonii*** Fitch, 1857m:487.
Cicindela circumpecta Laferte.

Family BUPRESTIDAE

253. ***Chalcophora novaeboracensis*** Fitch, 1858e:701.
Chalcophora virginienensis Drury.
Original Specimens: 5033, Terrytown, PA, vii(?)1852, from George T.Horton; **2926, Salem, NY, vi.1853, in front yard; Salem, NY, 16.ix.1857, in pine woods, taken by T.R.Ashton; 14,855, Salem, NY, 8.vii.1858, on young pines.
254. ***Chalcophora oregonensis*** Fitch, 1858e:702.
Chalcophora oregonensis Fitch.
255. ***Chalcophora virginienensis immaculata*** Fitch, 1858e:700.

Family COCCINELLIDAE

256. ***Adonia parenthesis albomaculata*** Fitch, 1861hh:853.
Hippodamia parenthesis (Say).
257. ***Adonia parenthesis approximata*** Fitch, 1861hh:853.
Hippodamia parenthesis (Say).

258. **Coccinella novemnotata confluenta** Fitch, 1861hh:849.
Coccinella novemnotata Herbst.
Original Specimens: 5443, Stillwater, NY, 1835.
259. **Adonia parenthesis confluenta** Fitch, 1861hh:853.
Hippodamia parenthesis (Say).
260. **Coccinella novemnotata conjuncta** Fitch, 1861hh:849.
Coccinella novemnotata Herbst.
Original Specimens: 9931, North Cannon, Kent Co., MI, from T.E. Wetmore.
261. **Adonia parenthesis connata** Fitch, 1861hh:854.
Hippodamia parenthesis (Say).
262. **Adonia parenthesis discopunctata** Fitch, 1861hh:853.
Hippodamia parenthesis (Say).
Original Specimens: *9530, Salem, NY, 9.vi.1851, west border of Jarvis Martin's woods, on grass in a marshy spot.
263. **Coccinella novemnotata divisicollis** Fitch, 1861hh:849.
Coccinella novemnotata Herbst.
Original Specimens: 13,943, Salem, NY, 2.xi.1853, Titus's hill.
264. **Coccinella novemnotata inaequalis** Fitch, 1861hh:849.
Coccinella novemnotata Herbst.
265. **Adonia parenthesis insulata** Fitch, 1861hh:854.
Hippodamia parenthesis (Say).
266. **Coccinella quinquenotata interrupta** Fitch, 1861hh:851.
Coccinella transversoguttata Falderman.
267. **Adonia parenthesis linearis** Fitch, 1861hh:853.
Hippodamia parenthesis (Say).
Original Specimens: 13,786, Canajoharie, NY, from Wm.S. Robertson.
268. **Adonia parenthesis lituricollis** Fitch, 1861hh:853.
Hippodamia parenthesis (Say).
269. **Adonia parenthesis nimia** Fitch, 1861hh:854.
Hippodamia parenthesis (Say).
270. **Coccinella novemnotata parvamaculata** Fitch, 1861hh:849.
Coccinella novemnotata Herbst.
Original Specimens: 2484, Tullehassie, AR, from Wm. S. Robertson.
271. **Adonia parenthesis permacrifrons** Fitch, 1861hh:853.
Hippodamia parenthesis (Say).
272. **Adonia parenthesis triangularis** Fitch, 1861hh:853.
Hippodamia parenthesis (Say).
273. **Adonia parenthesis tridentifrons** Fitch, 1861hh:853.
Hippodamia parenthesis (Say).

Family MELOIDAE

274. **Canatharis pyrivora** Fitch, 1857m:354.
Lytta sayi (LeConte).
Original Specimens: 2960-61, Canajoharie, NY, vi.1838, from Wm.S. Robertson; *1704-05, Newburgh, NY, vi.1838, from Drs. Prime and Emmons.

Family SCARABAEIDAE

275. **Macroductylus barbatus** Fitch, 1863e:681.
Macroductylus subspinosus (Fabricius).
Original Specimens: 327,427, Salem, NY, 1831; **7220, Greenbush, NY, 22.vii.1857, on roses; *8768-69, Saratoga Springs, NY, 26.vi.1863, on grape vines, from Mr. Chase; 7516, Canajoharie(?), NY, from Wm.S. Robertson; 14,391, Brooklyn, NY, from Stephen Calverly.
276. **Anomola lucicola maculicollis** Fitch, 1857m:403.
Original Specimens: 5532, Stillwater, NY, 1.vii.1836, on elm; east side of Bartlett's swamp; *3464-71, Stillwater, NY, 16.vii.1846, on wild grapevines, west of grandmother's; *3476, Stillwater, NY, 16.vii.1846, on pines, west of grandmother's; *5145, Stillwater, NY, 15.vii.1847, on walnut bushes, west of grandmother's; *7715, Salem, NY, 6.vii.1848, on grapevines, in the meadow.
277. **Valgus serricollis** Fitch, 1858e:697.
Valgus canaliculatus Oliver, NEW SYNONYMY.
Original Specimens: 3539-40, Jackson, MS, 2.iv.1852, from Sara E. Fitch.

Family CERAMBYCIDAE

278. **Saperda lateralis abbreviata** Fitch, 1859d:841.
Saperda lateralis Fabricius.
Original Specimens: *1193, Greenwich, NY, 13.vi.1845, on raspberry briars, north of Peter Dunlap's.
279. **Phymatodes albofasciatus** Fitch, 1859d:793.
Original Specimens: **1258-60, Salem, NY, 28.v.1852, on trunk of a black oak tree, Jarvis Martin's woods.
280. **Saperda tridentata intermedia** Fitch, 1858d:840.
Saperda tridentata Olivier.
Original Specimens: Salem, NY, 4.vii.1858, "...a specimen showed me, captured by Baron Osten Sacken, on the window of the hotel."
281. **Eupogonius pinivora** Fitch, 1858e:712.
Eupogonius tomentosus (Haldeman).
Original Specimens: 14,861-862, Salem, NY, 8.vii.1858, beat from young pines, pine woods.
282. **Leiopus querci** Fitch, 1859d:796.
Urgleptes querci (Fitch).
Original Specimens: *4895, Salem, NY, 5.vii.1847, on black oak, bank of the kill; *6775, Long Island, NY, 1847, from Wm.S. Robertson.
283. **Saperda tridentata rubronotata** Fitch, 1859d:840.
Saperda tridentata Olivier.
Original Specimens: 14,924, New York, NY, from T.B. Ashton.
284. **Saperda lateralis suturalis** Fitch, 1859d:841.
Saperda lateralis Fabricius.
Original Specimens: *4658, Salem, NY, 28.vi.1847, on walnut, Jarvis Martin's woods.

Family CHRYSOMELIDAE

285. **Crioceris trilineata tripunctata** Fitch, 1865l:446.
Lema trilineata (Olivier).

286. **Crioceris trilineata unipunctata** Fitch, 1865l:446.

Lema trilineata (Olivier).

Family BRUCHIDAE

287. **Bruchus fabae** Fitch, 1861g:63.

Acanthoscelides obtectus (Say), NEW SYNONYMY.

Family SCOLYTIDAE

288. **Hylastes carbonarius** Fitch, 1858e:730.

Hylastes porculus Erichson.

Original Specimens: *3561, Salem, NY, 15.vii.1846, about the house and yards.

Extant Specimens: *3561/Collection Fitch/Type No. 42808, U.S.N.M./*Hylastes carbonarius* (USNM).

289. **Tomicus xylographus fulvus** Fitch, 1858e:716.

290. **Tomicus mali** Fitch, 1857m:326.

Monarthrum mali (Fitch).

Original Specimens: *1862-66, Middlefield, MA, 6.vi.1857, from Lawrence Smith; 3273, OH, from Dr. Robert H. Mack.

291. **Tomicus materiarius** Fitch, 1858e:726.

Gnathotrichus materiarius (Fitch).

Original Specimens: 26.i.1858, from burrow in dead pine.

292. **Tomicus xylographus niger** Fitch, 1858e:716.

293. **Tomicus xylographus nigricollis** Fitch, 1858e:716.

294. **Hylastes pinifex** Fitch, 1858e:729.

Hylurgops pinifex (Fitch).

Original Specimens: 1527-28, Stillwater, NY, 4.v.1837, near Wilbur's Basin; *7268, Salem, NY, iv.1848, yard of Jarvis Martin's sawmill; **758-67, Salem, NY, 7.v.1852, on new pine boards.

Order MECOPTERA

Family BOREIDAE

295. **Boreus brumalis** Fitch, 1847g:278.

Boreus brumalis Fitch.

Original Specimens: *1864, Salem, NY, i.1846, woodlot by McDougall's Lake; 12,250, Salem, NY, 9.ii.1847, on snow, big hill; 12,256, Salem, NY, 9.ii.1847, on snow, woods south of McDougall's; 4267-70, 4.iii.1847, on melting snow, woodlot by McDougall's Lake.

Note: A specimen in the USNM collection bears Fitch's label 14,520. Two specimens in the MCZ collection bear his labels **316 and *7095, and they are also labeled "Type." According to Fitch's specimen registers, these specimens were collected in 1856, 1851, and 1848, respectively. Therefore, they are not part of the original type series.

296. **Boreus nivoriundus** Fitch, 1847g:277.

Boreus nivoriundus Fitch.

Original Specimens: 9974-75, Salem, NY, 15.iii.1845, walking on snow that had fallen the night before, east bor-

der of beech woods, south of McDonald's; 10,031-053, Salem, NY, 5.iv.1845, east border of beech woods, south of McDonald's; 10,061-066, Salem, NY, 7.iv.1845, on snow, in Jarvis Martin's woods; *1860-61, Salem, NY, i.1846, woodlot by McDougall's Lake; *4248-49, Salem, NY, 2.ii.1847, on melting snow, woodlot by McDougall's Lake; 12,251-255, Salem, NY, 9.ii.1847, woods of big hill and woods south of McDougall's; *4264-66, Salem, NY, 4.iii.1847, on melting snow, woodlot by McDougall's Lake.

Note: Two specimens in the USNM collection bear Fitch's labels 14,528 and 15,001. Two specimens in the MCZ collection bear his labels *8088 and *8090, and they are also labeled "Type." According to Fitch's specimen registers these specimens were collected in 1856, 1859, 1851, and 1851, respectively. Therefore, they are not part of the original type series.

Order DIPTERA

Family TRICHOCERIDAE

297. **Trichocera brumalis** Fitch, 1847g:283.

Trichocera brumalis Fitch.

Original Specimens: 12,112-123, Salem, NY, 28.xii.1846, on snow on the big hill.

Family CULICIDAE

298. **Culex hyemalis** Fitch, 1847g:281.

Anopheles punctipennis (Say).

Original Specimens: Salem, NY, 14.xi.1845, on window; Greenwich, NY, 17.xi.1845, on window at Peter Dunlap's; Salem, NY, 8.xii.1845, on window of back room.

Extant Specimens: 6850/Type No., U.S.N.M./Fitch's Collection/*Anopheles* Meigen, *hyemalis*, Fitch, New York (USNM); Type of A.Fitch/Type 4049/*Anopheles* (Culex) *hyemalis*, Fitch (MCZ).

Family CHIRONOMIDAE

299. **Chironomus nivoriundus** Fitch, 1847g:282.

Diamesa nivoriunda (Fitch).

Original Specimens: 10,055, Salem, NY, 5.iv.1845, in Teff's woods, with *Boreus nivoriundus*; 10,056, Salem, NY, 7.iv.1845, in Jarvis Martin's woods, with *Boreus nivoriundus*; *4252, Salem, NY, 2.ii.1847, on snow, woodlot by McDougall's Lake; *4090-92, Salem, NY, 4.iii.1847, on snow, woodlot by McDougall's Lake; 12,290-317, Salem, NY, spring 1847, on melting snow.

Family SCIARIDAE

300. **Molobrus fuliginosus** Fitch, 1856l:487.

Sciara fuliginosa (Fitch).

Original Specimens: *1287, 24.vi.1845, Salem, NY, near outlet of McDougall's Lake; 10,653, Salem, NY, 27.vi.1845, on weeds and grasses, near the outlet of McDougall's Lake; 10,689, *1351, Greenwich, NY, 1.vii.1845, woods west of Alex. Cherry's; 11,114, Salem, NY, 11.viii.1845, on office window.

301. **Molobrus inconstans** Fitch, 1856l:487.
Sciara inconstans (Fitch).
Original Specimens: 14, 143, Salem, NY, 21.xii.1855, evening, on paper on writing table; Salem, NY, 24.xii.1855, on office window, two specimens seen.
302. **Molobrus mali** Fitch, 1856l:484.
Lycoriella mali (Fitch).
Extant Specimens: *Molobrus mali* Fitch, *Lycoriella*, ex Fitch Coll.(USNM).
303. **Molobrus vulgaris** Fitch, 1856l:487.
Sciara vulgaris (Fitch).
Original Specimens: 10,627, 10,639, Salem, NY, 27.vi.1845, on office window; *1350, Greenwich, NY, 1.vii.1845, woods west of Alex.Cherry's; 10,688, Salem, NY, 3.vii.1845, on office window; 10,726, 10,729-730, 10,736, Salem, NY, 8.vii.1845, on grass in front yard; 10,947, Salem, NY, 21.vii.1845, on office window; 10,957, Salem, NY, 21.vii.1845, swamp on Deacon Clark's woodlot; 11,057-060, Salem, NY, 1.viii.1845, on office window; 11,073, 11,106-107, Salem, NY, 7.viii.1845, on office window; 11,197-198, Salem, NY, 12.viii.1845, on window in back room, in home.

Family CECIDOMYIIDAE

304. **Cecidomyia amyotii** Fitch, 1861hh:773.
Sitodiplosis mosellana (Géhin).
Original Specimens: Salem, NY, 12.vi.1861, around lamp in house.
305. **Cecidomyia caliptera** Fitch, 1845c:262.
Lestodiplosis caliptera (Fitch).
Original Specimens: 10,846, Salem, NY, 11.vii.1845, on office window; 11,032, Salem, NY, 1.viii.1845, on office window; 11,084, 11,087, Salem, NY, 7.viii.1845, on office window; 11,115, Salem, NY, 11.viii.1845, on office window; 11,337-338, 11,347, 11,351, 11,365, Salem, NY, 16.viii.1845, on office window; 11,416, Salem, NY, ix.1845, on office window.
Extant Specimens: 10,846, from Fitch Collection, *Cecidomyia caliptera* Fh., mntd.1969 R.J.G., Can.balsam (USNM).
306. **Cecidomyia cerealis** Fitch, 1845c:263.
Clinodiplosis graminia (Fitch).
Note: *Cecidomyia cerealis* Fitch is a junior secondary homonym of *C.cerealis* (Sauter), 1817. Fitch proposed *C.graminis* as a replacement name.
307. **Cecidomyia graminis** Fitch, 1861hh:832.
Clinodiplosis graminis (Fitch).
Original Specimens: 10,519, Salem, NY, 16.vi.1845, Jarvis Martin's wheat field; 10,721, Salem, NY, 8.vii.1845, among grass in front yard; 11,164, 11,166, Salem, NY, 12.viii.1845, on back room window; 11,339, 11,344, 11,349, 11,350, Salem, NY, 16.viii.1845, on office window; 11,417, Salem, NY, ix.1845, on office window.
Note: Fitch proposed *Cecidomyia graminis* as a replacement name for *C.cerealis* Fitch, which is preoccupied by *C.cerealis* (Sauter).
Three specimens in the USNM collection bear Fitch's labels 11,571, 16,848, and 17,000. According to Fitch's speci-

men registers, the first specimen was collected in 1846, and the latter two in 1872. Therefore, they are not part of the original type series.

308. **Cecidomyia grossulariae** Fitch, 1855n:880.
Clinodiplosis grossulariae (Fitch), NEW COMBINATION.
Original Specimens: NY, July, in some gooseberries prematurely turned red, and with their pulp putrid.
Extant Specimens: USNM (Slide), from Fitch Collection, mtd.1969 R.J.G., Can.balsam (USNM, two specimens).
309. **Cecidomyia inimica** Fitch, 1861hh:830.
Mycodiplosis inimica (Fitch).
310. **Cecidomyia pseudacaciae** Fitch, 1859d:833.
Dasineura pseudacaciae (Fitch).
Original Specimens: Vial No.114, July to August, 1854, larvae in the leaves of the locust tree.
311. **Cecidomyia salicis** Fitch, 1845b:263.
Mayetiola rigidae (Osten Sacken).
Original Specimens: NY, forming galls the size of a sparrow's egg on the tips of willow twigs, in winter and again in summer.
Extant Specimens: *Cecidomyia salicis* Fitch, Salem, NY, from willow galls, April 1, '52 (MCZH); Loew Coll./ *Cecidomyia salicis* Fitch, female (MCZ).
312. **Cecidomyia tergata** Fitch, 1845c:264.
Original Specimens: 11,044-045, Salem, NY, 1.viii.1845, on office window; 11,081, Salem, NY, 7.viii.1845, on office window; 11,136-149, Salem, NY, 12.viii.1845, on window of back room, in house.
313. **Cecidomyia thoracica** Fitch, 1845c:264.
Mycodiplosis thoracica (Fitch), NEW COMBINATION.
Original Specimens: 11,372, 11,375, 11,383, 11,387, 11,407, Salem, NY, 16 & 18.viii.1845, on office window.

Family ASILIDAE

314. *Trupanea apivora* Fitch, 1864f:63.
Promachus fitchii Osten Sacken.
Note: *Trupanea apivora* Fitch is a junior primary homonym of *T. apivora* Walker, 1860.

Family EMPIDIDAE

315. **Oscinis crassifemoris** Fitch, 1856l:533.
Platypalpus crassifemoris (Fitch).
Original Specimens: Salem, NY, 30.vi.1856, swept from wheat.
Extant Specimens: *Oscinis crassifemoris*/Type No.789, U.S.N.M./*Platypalpus crassifemoris* (Fitch) Coq.(USNM).

Family DIOPSIDAE

316. **Sphyracephala subbifasciata** Fitch, 1855n:774.
Sphyracephala brevicornis (Say).
Original Specimens: 7906, north of Ottawa, IL, 17.x.1854, swept from grass, at base of the bluffs, in company with Dr.J.C.Harris; **5912-22, Salem, NY, 8.x.1855, in sand gully, east end of Battle Hill; **6021-26, Salem, NY, 10.x.1855, in sand gully, east end of Battle Hill.

Extant Specimens: **5912/30/Loew/Type A.Fitch/ *subbifasciata* (MCZ); **6022/Loew/Type of A.Fitch/ *Sphyracephala subbifasciata* Fitch (MCZ); **6024/Loew/Type A.Fitch (MCZ); Fitch Coll./*Sphyracephala subbifasciata* (USNM).

Family PLATYSTOMATIDAE

317. **Tephritis melliginis** Fitch, 1855n:769.

Rivellia melliginis (Fitch).

Original Specimens: NY, 3.vii.1855, on Balm of Gilead twigs infested by aphids.

Extant Specimens: Fitch Coll./*Tephritis melliginis* Fitch (USNM).

Family TEPHRITIDAE

318. **Acinia novaeboracensis** Fitch, 1855n:771.

Eutreta sparsa (Wiedemann).

Original Specimens: *5445, Salem, NY, 27.vii.1847, on *Cornus paniculata*, Esq.Martin's meadow by kill; **5768-69, Salem, NY, 20.vii.1855, beat from weeds on Small's I., Batten Kill.

Extant Specimens: **5768/Type No.4394, U.S.N.M./ *Acinia novaeboracensis* (USNM).

319. **Acinia solidaginis** Fitch, 1855n:771.

Eurosta solidaginis (Fitch).

Original Specimens: 10,139-144, NY, hatched about 1.iv.1845 from galls placed in stove room, 19.ii; **5393, 24.v.1855, hatched from *Solidago* gall, in the office.

Extant Specimens: *Acinia solidaginis* Fitch/Type No.788 (USNM).

320. **Tephritis tabellaria** Fitch, 1855n:770.

Rhagoletis tabellaria (Fitch).

Original Specimens: **5750, Salem, NY, 20.vii.1855, on weeds on Small's Island, Batten Kill.

Family SCIOMYZIDAE

321. **Tetanocera saratogensis** Fitch, 1855n:772.

Limnia sp.

Original Specimens: **1441, Salem, NY, 8.vii.1845, on grass in front yard.

Extant Specimens: Fitch Coll./*Tetanocera saratogensis*/ *Limnia saratogensis* Fitch (USNM).

Family LAUXANIIDAE

322. **Chlorops antennalis** Fitch, 1856l:532.

Camptoprosopella antennalis (Fitch).

Original Specimens: Salem, NY, 28 & 30.vi.1856, swept from wheat.

323. **Chlorops vulgaris** Fitch, 1856l:532.

Camptoprosopella vulgaris (Fitch).

Original Specimens: 30.vi.1856, swept from young wheat.

Extant Specimens: *Chlorops vulgaris* (USNM).

Note: The label on the above specimen is written in Fitch's handwriting, but it is not labelled as a type.

Family MILICHIIDAE

324. **Agromyza tritici** Fitch, 1856l:534.

Meoneura obscurella (Fallén).

Original Specimens: 14,266-291, Salem, NY, from Harvey's wheat, in barn, threshed.

Extant Specimens: 14,269/Fitch's Type/From Fitch's Collection/*Agromyza tritici*/Type No.787, U.S.N.M./Type of *Agromyza tritici* Fitch (USNM).

Family CHLOROPIDAE

325. **Meromyza americana** Fitch, 1856l:531.

Meromyza americana Fitch.

Original Specimens: Salem, NY, 28.vi.1856, swept from spring wheat.

Extant Specimens: *Meromyza americana*/Fitch's Type, from Fitch's Collection/Type No.786 (USNM).

326. **Oscinis coxendix** Fitch, 1856l:533.

Apallates coxendix (Fitch).

Original Specimens: Salem, NY, 30.vi.1856, swept from growing wheat.

Extant Specimens: *Oscinis coxendix*/Fitch's Type/From Fitch's Collection/Type No.385 (USNM).

327. **Chlorops hortensis** Fitch, 1872a:363.

Thaumatomyia glabra (Meigen).

328. **Siphonella obesa** Fitch, 1856l:531.

Thaumatomyia glabra (Meigen).

Extant Specimens: *Siphonella obesa*/Fitch's Type/From Fitch's Collection (USNM).

329. **Oscinis tibialis** Fitch, 1856l:532.

Rhopalopterum soror (Macquart).

Original Specimens: Salem, NY, 30.vi.1856, swept from growing wheat.

Extant Specimens: *Oscinis tibialis*/Type No.384 (USNM).

Family ANTHOMYIIDAE

330. **Hylemyia deceptiva** Fitch, 1856l:533.

Delia platyura (Meigen).

Original Specimens: *4438-45, *4447-49, Salem, NY, 25.vi.1847, in Josephus Martin's winter wheat; *4736-41, Salem, NY, 30.vi.1847, in Josephus Martin's winter wheat.

331. **Hymelyia similis** Fitch, 1856l:533.

Delia platyura (Meigen).

Original Specimens: *4434, *4436-37, *4440, Salem, NY, 25.vi.1847, on wheat heads in Josephus Martin's field; *4742-46, Salem, NY, 30.vi.1847, on wheat heads in Josephus Martin's field.

Family CUTEREBRIDAE

332. **Cuterebra emasculator** Fitch, 1857m:478.

Cuterebra emasculator Fitch.

Original Specimens: 2831, Tullehassie, AR, 1851, from Wm.S.Robertson; 13.viii.1856, in scrotum of striped squirrel, from Peter Reid.

Extant Specimens: Fitch's Type/From Fitch's Collection/ TD 4652/*Cuterebra emasculator*, Fh./positively not the holotype!! Disagrees with descr'n, important characters!!
Det.CHTT/probably *augustifrons* Dalmat, det.Sabrosky (USNM).

Order LEPIDOPTERA

Family PIERIDAE

333. **Nathalis irene** Fitch, 1857m:485.
Nathalis iole Boisduval.
Original Specimens: 2717, Tullehassie, AR, 1851, from Wm.S.Robertson.
334. **Colias santes** Fitch, 1854c:378.
Colias philodici Godart.
Original Specimens: *6680, Salem, NY, autumn 1847.

Family NYMPHALIDAE

335. **Vanessa lintnerii** Fitch, 1857m:485.
Nymphalis antiopa lintnerii (Fitch).

Family NOLIDAE

336. **Brachytaenia triquetrana** Fitch, 1856l:476.
Celama triquetrana (Fitch).
Original Specimens: *749, Salem, NY, 26.iv.1845, flying, around Jarvis Martin's woods.

Family ARCTIIDAE

337. **Hyphantria collaris** Fitch, 1857m:383.
Cyenia tenera Hübner.
Original Specimens: 7241, Jackson, MS, 1853, from Sara E.Fitch.
338. **Hyphantria punctata** Fitch, 1857m:383.
Hyphantria cunea Drury.
Original Specimens: *7652, Salem, NY, 22.vi.1848, laying its eggs on ash, front yard; 1138, Tullehassie, AR, vi.1851, from Wm.S.Robertson; *4274, Salem, NY, 28.vi.1854, swept from grass in the meadow; Salem, NY, 15.vi.1856, in the woods on Battle Hill; 14,635, Salem, NY, 14.vi.1857, on a dead twig, dugway woods.
339. **Atolmis tricolor** Fitch, 1857m:486.
Hypoprepia fucosa Hübner.
Original Specimens: 6814, Salem, NY, 1831; *3265, Salem, NY, 10.vii.1846, beat from pine bushes on the dugway; *3341, Salem, NY, 13.vii.1846, beat from bushes, in meadow, by footbridge; 11,821-822, Salem, NY, 24.vii.1846, at rest upon the leaves of a beech tree, border of Jarvis Martin's woods; 5090, Terrytown, PA, vii.1852, from Geo.F.Horton; **4566, Salem, NY, 20.vii.1854, in the yard; Salem, NY, 3.viii.1855, in the house, evening; **7140, Salem, NY, 20.vii.1857, resting, in candlelight on front stoop; 12,901, Canajoharie, NY, from Wm.S.Robertson; Schoharie, NY, taken by J.A.Lintner.

Family NOCTUIDAE

340. **Hadena amputatrix** Fitch, 1857m:425.
Septis arctica Boisduval.
Original Specimens: Salem, NY, 1829; Salem, NY, 1831; *1418, Salem, NY, 5.vii.1845, on office window, evening; *1854, Salem, NY, viii.1845, about the house; *3552, Salem, NY, vi.1846, about the house; 89, East Greenwich, RI, viii.1846, from Pliny F. Martin; **1785, Salem, NY, 7.vii.1852, behind window shutters of office; **2913, Salem, NY, 28.vi.1853, evening, in the house; **3084, Salem, NY, 8.vii.1853, in front yard at twilight; **4204-05, Salem, NY, 26.vi.1854, in the house; 12,910, Canajoharie(?), NY, from Wm.S.Robertson.
341. **Hypena elegantalis** Fitch, 1856l:559.
Pangrapta decoralis Hübner.
342. **Agrotis nigricans maizi** Fitch, 1865g:804.
Euxoa tessellata maizi (Fitch).
343. **Brachytaenia malana** Fitch, 1856l:473.
Balsa malana (Fitch).
Original Specimens: *4944, Salem, NY, 6.vii.1847, in front yard; 14,139, Salem, NY, 25.vii.1854, hatched from worm fed on apple; 14,140, Salem, NY, 19.xii.1855, hatched from worm fed on apple; 14,150, Salem, NY, 23.i.1856, hatched from worm fed on spple.
Extant Specimens: 14,140, (*Brachytaenia*) Steph., *malana*, Fitch, New York/Type No.225 (USNM).
344. **Alaria volupia** Fitch, 1868b:908.
Rhododipsa volupia (Fitch).
Original Specimens: *1040, Tullehassie, AR, 1855, from Wm.S.Robertson.
Extant Specimens: *Alaria volupia*, Fh./*1040/Type No.283 (USNM).

Family NOTODONTIDAE

345. **Clostera albosigma** Fitch, 1856l:506.
Melalopha albosigma (Fitch).
Original Specimens: Salem, NY, 25.vii.1855, hatched in the office; Salem, NY, 13.vii.1856, in house, morning, on walls, Agricultural Museum.
Extant Specimens: *Clostera* Hoffman, *albosigma*, Fitch, White S, New York/Type No.356 (USNM).
346. **Clostera vau** Fitch, 1859d:845.
Melalopha apicalis Walker.
Original Specimens: 6812, Stillwater(?), NY; 15,020, Salem, NY, 4.vi.1859, on kitchen window, in the morning.

Family LYMANTRIIDAE

347. **Orgyia leucostigma borealis** Fitch, 1856d:218.
Orgyia leucostigma intermedia Fitch.
Extant Specimens: *Org.leucostig.borealis*/Type No.1412, U.S.N.M./Slide No.52015, D.C.Ferguson (USNM).
348. **Orgyia leucostigma intermedia** Fitch, 1856l:445.
Orgyia leucostigma intermedia Fitch.
Original Specimens: 14,156, Salem, NY, 31.vii.1855.
Extant Specimens: 14,156/Type No.1413, U.S.N.M./O. *leucostigma*., *B.intermedia*, New York (USNM).

349. **Orgyia nova** Fitch, 1863e:675.
Orgyia antiqua nova Fitch.
 Original Specimens: 15,391-392, Salem, NY, 10.vii.1863, resting on its cocoon, newly hatched; 15,393, 20.vii.1863, in office, flitting about for the female; 15,394, 20.vii.1863, female, newly hatched from cocoon; 15,399, 27.vii.1863, male, that paired with the preceeding.
 Extant Specimens: 1539/*Orgyia nova*/Type No. 354, U.S.N.M./male gen.slide, by DCF, USNM 52342/Figured in Moths of America North of Mexico (USNM).

Family LASIOCAMPIDAE

350. **Planosa laricis** Fitch, 1856l:494.
Tolyte laricis (Fitch).
 Original Specimens: *5923, vicinity of Albany, NY, 1847, taken by Mr.Salisbury; Salem, NY, 24.vii.1854, hatched from cocoons.
 Extant Specimens: *P.laricis*, female/New York/Type No.357 (USNM).
 Note: A specimen in the USNM collection bears Fitch's label 16,004, and it is also labelled "Type." According to Dr. Fitch's specimen registers, this specimen was collected in 1871, and, therefore, it is not part of the original type series.

Family GEOMETRIDAE

351. **Priocycla johnsonaria** Fitch, 1871:530.
Euchlaena johnsonaria (Fitch).
 Original Specimens: Salem, NY, 28.vi.1870, flew in at open door of office, attracted by lamp.
 Extant Specimens: *Priocycla johnsonaria*, Fitch/Type No.4317 (USNM).
352. **Abraxas(?) ribearia** Fitch, 1848b:466.
Itame ribearia (Fitch).
 Original Specimens: 8614, Salem, NY, 1.vii.1844, in front yard, caught by lamp light; 8729-34, Salem, NY, 2.vii.1844, evening, taken by lamp light; *316, Salem, NY, 13.vii.1844, attracted into window, by candlelight; *3535-50, Salem, NY, 17.vi.1846, in Emmons' garden, about currant bushes; *3555, Salem, NY, 17.vi.1846; *3238-39, Salem, NY, 9.vii.1846, about the house and office; *4782, Salem, NY, 30.vi.1847, about the house; *4942, Salem, NY, 6.vii.1847, in front yard; *5012, Salem, NY, 10.vii.1847, attracted into house, by candlelight; *5088, Saratoga Springs, NY, 16.vii.1847; *5019-21, Salem, NY, 17.vii.1847, attracted into house by candlelight.
353. **Geometra(?) siccifolia** Fitch, 1857m:381.
Nemoria bistriata bistriata Hübner, NEW SYNONYMY.
354. **Amilapis triplipunctata** Fitch, 1859d:825.
Hypagyrtis unipunctata (Haworth).
 Original Specimens: Salem, NY, 3.vii.1859, hatched from larva beat from white oaks on Battle Hill, 11.vi.1859.
 Extant Specimens: July 9, '59, Battle Hill (USNM).

Family PYRALIDAE

355. **Tinea zaeae** Fitch, 1856l:552.
Plodia interpunctella Hübner.
 Original Specimens: *4183, East Greenwich, NY,

17.xi.1846, in cracks in the walls of the gristmill; Salem, NY, 8.ix.1855, in a bag of emptying cakes, abundant with its larvae feeding upon them; 14,155, Salem, NY, 26.ii.1856, flying in office, near bag of cakes; Salem, NY, 20.vi.1856, flying in office near bag of cakes.

Family PTEROPHORIDAE

356. **Pterophorus cineridactylus** Fitch, 1855n:848.
Oidaematophorus monodactylus (Linnaeus).
 Original Specimens: **5649, Salem, NY, 10.vii.1855, in front yard, taken by candlelight.
357. **Pterophorus cretidactylus** Fitch, 1855n:849.
Oidaematophorus cretidactylus (Fitch).
 Original Specimens: 13,843, Stillwater, NY, 12.vii.1836, in woods west of grandmother's.
358. **Pterophorus lobidactylus** Fitch, 1855n:847.
Trichoptilus lobidactylus (Fitch).
 Original Specimens: *7667, Salem, NY, 28.vi.1848, border of Esq.Martin's meadow, on bushes.
359. **Pterophorus marginidactylus** Fitch, 1855n:848.
Platyptilia pallidactyla (Haworth).
 Original Specimens: 8426, Salem, NY, 21.vi.1844, on plants in the meadow.
360. **Pterophorus naevosidactylus** Fitch, 1855n:849.
Oidaematophorus monodactylus (Linnaeus)
 Original Specimens: **3339, Salem, NY, 11.viii.1853, in the house, evening; Salem, NY, 10.viii.1854, in the house, evening; **4792, Salem, NY, 23.viii.1854, evening, in house.
361. **Pterophorus nebulaedactylus** Fitch, 1855n:849.
Platyptilia pallidactyla (Haworth).
 Original Specimens: 8378, Salem, NY, 17.vi.1844, evening, dugway woods, taken by lamp; 8624, Salem, NY, 1.vii.1844, evening, in front yard, taken by lamp; *3005-06, Salem, NY, 18.vi.1846, evening, in front yard; *4789, Salem, NY, 5.vii.1847, about the house; *4966, Salem, NY, 9.vii.1847, in the house, attracted by lamp; *4989, Salem, NY, vii.1847, in the house; **5648, Salem, NY, 10.vii.1855, in front yard, attracted by lamp.
362. **Pterophorus periscelidactylus** Fitch, 1855n:843.
Pterophorus periscelidactylus Fitch.
 Original Specimens: Union Village, NY, 16.vi.1855, caterpillars upon the Isabella grapevines in Mr.Master's garden, on the younger and more tender leaves.
363. **Pterophorus tenuidactylus** Fitch, 1855n:848.
Pterophorus tenuidactylus Fitch.
 Original Specimens: *1497, Salem, NY, 14.vii.1845, north base of Battle Hill; 10,891, Granville, NY, 16.vii.1845, sphagnous swamp, on the wing; *3422, Stillwater, NY, 16.vii.1846, on white pine, in big swamp.

Family OLETHREUTIDAE

364. **Ephippophora caryana** Fitch, 1857m:459.
Cydia caryana (Fitch).
 Original Specimens: 14,571-572, Easton, NY, iv.1857, from Lewis Potter.

Extant Specimens: 14,571/*Ephippophora? caryana*/Type No.394 (USNM).

Note: A specimen in the USNM collection bears Fitch's label 14,957, and it is also labelled "Type." According to Fitch's specimen registers, this specimen was collected in 1859, and, therefore, it is not part of the original type series.

Family TORTRICIDAE

365. *Lozotaenia cerasivorana* Fitch, 1857m:382.

Archips cerasivorana (Fitch).

Original Specimens: *157, Salem, NY, 9.vii.1844, in front yard, by candlelight; **7128, Salem, NY, 18.vii.1857, on front porch, by candlelight; **7081, Salem, NY, 19.vii.1857, on chokecherry, meadow over White Creek; Salem, NY, 21.vii.1857, on chokecherry.

366. *Croesia persicana* Fitch, 1857m:357.

Archips persicana (Fitch).

Original Specimens: Salem, NY, 6.vii.1857, bred from larva on peach leaves, specimen in Agricultural Museum.

367. *Argyrolepis quercifolia* Fitch, 1859d:826.

Argyrotaenia quercifolia (Fitch).

Original Specimens: **4464-65, Salem, NY, 9.vii.1854, in woods on Battle Hill.

Family COCHYLIDAE

368. *Argyrolepis pomariana* Fitch, 1853a (unpaged).

369. *Argyrolepis sylvatica* Fitch, 1853a (unpaged).

Original Specimens: *354, Salem, NY, 17.vii.1844, in woods of woodlot, by McDougall's Lake; *3531, Stillwater, NY, 16.vii.1846, in house, attracted by candle; *6123, Salem, NY, 21.viii.1847, near McDougall's Lake, in the woods.

Family COSSIDAE

370. *Cossus querciperda* Fitch, 1859d:790.

Prionoxystus macmurtrei Guérin-Méneville.

Extant Specimens: *Cossus querciperda*, 270, Type, Fitch, male (NYSM); *Cossus querciperda*, 137, Type, Fitch, female (NYSM).

Family GELECHIIDAE

371. *Chaetochilus contubernalis* Fitch, 1853b:39.

Dichomeris ligulella Hübner.

Original Specimens: **3076, Salem, NY, 8.vii.1853, in front yard at twilight; **3205, Salem, NY, 9.vii.1853, on weeds, under a white oak, northeast corner of upper island, in the meadow.

372. *Chaetochilus malifoliellus* Fitch, 1856l:463.

Dichomeris ligulella Hübner.

373. *Anacampsis robiniella* Fitch, 1859d:834.

Recurvaria robiniella (Fitch).

Original Specimens: **4252-54, Salem, NY, 27.vi.1854, evening, attracted into house, by light; **5585, Salem, NY, 5.vii.1855, evening, in the office; 15,045, Salem, NY, 4.viii.1859, evening, around lamp in house.

374. *Chaetochilus ventrellus* Fitch, 1856l:466.

Dichomeris ventrella (Fitch).

Original Specimens: **5947, Salem, NY, 1.xi.1855, flying, in dugway woods.

Extant Specimens: **5947/Stephens, *Chaetochilus ventrellus* Fitch MSS, New York/This specimen is from Fitch's own collection and is presumably his true type/ Genitalia slide by JFGC, male, USNM 10,641 (USNM).

Family OECOPHORIDAE

375. *Chaetochilus trimaculellus* Fitch, 1856l:465.

Eido trimaculella (Fitch).

Original Specimens: Salem, NY, 21.vi.1856, resting on door-post of office, in shade.

Extant Specimens: This spcm found in Fitch's Coll. with his label undoubtedly is the true type!, AB 1900 (USNM).

Family PLUTELLIDAE

376. *Cerostoma brassicella* Fitch, 1855n:874.

Plutella maculipennis Curtis.

Original Specimens: *283, Salem, NY, 13.vii.1844, singed by lamp, in house, evening; **4741, Salem, NY, 15.viii.1854, in garden upon beet leaves; 7883-90, near Ottawa, IL, 15.x.1854, abundant in gardens.

Family YPONOMEUTIDAE

377. *Deiopeia aurea* Fitch, 1857m:486.

Attava aurea (Fitch), NEW COMBINATION.

Original Specimens: *1355, Savannah, GA, 1856, from Mrs.Wm.G.Dickson.

Family GRACILARIIDAE

378. *Argyromiges morrisella* Fitch, 1859d:838.

Phyllonorycter morrisella (Fitch).

Original Specimens: 19.i.1859, torpid, under shaggy bark of hickory.

Extant Specimens: Type/Figured by Miss A. Braun, Febr.1908/*Argyromiges morrisella*, Fh.(USNM).

379. *Argyromiges ostensackenella* Fitch, 1859d:838.

Phyllonorycter ostensackenella (Fitch).

Original Specimens: Right hand specimen, Salem, NY, 1.vii.1856, on office window in the morning; Left hand specimen, Salem, NY, 16.viii.1857, evening, in the house, on table, by candle.

Extant Specimens: *Argyromiges ostensackenella*, Fh./ Type No.512 (USNM, two specimens mounted together).

380. *Argyromiges pseudacaciella* Fitch, 1859d:836.

Phyllonorycter robiniella Clemens.

Original Specimens: *8155-57, Salem, NY, 12.iii.1851, torpid, under crevices of shaggy bark of hickory, pasture north of creek.

Extant Specimens: *Argyromiges pseudacaciella*/Type No. 514 (USNM).

381. *Argyromiges quercialbella* Fitch, 1859d:828.

Phyllonorycter quercialbella (Fitch).

Original Specimens: 13,848-849, 1846, bred from pupae in leaves gathered this year; Salem, NY, 23.v.1857, flying, on Battle Hill, among oaks, at sunset.

Extant Specimens: *Argyromiges quercialbella*, Fh./Type No.513 (USNM).

382. **Argyromiges quercifoliella** Fitch, 1859d:827.

Phyllonorycter fitchella Clemens.

Original Specimens: 16,985, Salem, NY, 4.xi.1857, larva mining chestnut oak leaves in front yard, put in a vial and this hatches therefrom.

383. **Argyromiges uhlerella** Fitch, 1859d:838.

Phyllonorycter uhlerella (Fitch).

Original Specimens: *8158, Salem, NY, 12.iii.1851, under bark of shaggy walnut, north of the creek, torpid.

Note: An insect pin in the USNM collection bears Fitch's label *8158, but the specimen is missing and, presumably, destroyed.

Family INCURVARIIDAE

384. **Ornix acerifoliella** Fitch, 1856t:501.

Paraclemensia acerifoliella (Fitch).

Original Specimens: *2690, Salem, NY, 20.v.1846, beat from pines, northwest corner of mill lot; *7339, Salem, NY, 12.v.1848, on maple leaves in meadow; **1168, Salem, NY, 24.v.1852, hatched from cases; **2817-18, Salem, NY, 21.v.1853, in woods on Battle Hill; **4531, Salem, NY, 11.vii.1854, hatched in the office.

Extant Specimens: *Ornix acerifoliella* Fitch/Fitch's type, Ang.Busck (USNM).

Order HYMENOPTERA

Family CIMBICIDAE

385. **Abia cerasi** Fitch, 1857m:385.

Trichiosoma triangulum Kirby.

Original Specimens: Salem, NY, 28.iii.1857, cocoon adhering to a twig of cherry, two feet above the ground, south side of Battle Hill; Salem, NY, 22.iv.1857, near the same spot, found another cocoon picked open by birds, on the upper side of a horizontal twig, three feet above the ground.

Family DIPRIONIDAE

386. **Lophyrus lecontei** Fitch, 1858e:744.

Neodiprion lecontei (Fitch).

Original Specimens: 7847, east of New Brunswick, NJ, 15.v.1854, swept from grass, border of woods.

Extant Specimens: Fitch Coll./7847/134, wing mounted/*Lophyrus lecontei* Fitch, female, Type?(USNM).

Family TENTHREDINIDAE

387. **Selandria(?) juglandis** Fitch, 1857m:467.

Eriocampa juglandis (Fitch).

Original Specimens: Salem, NY, 6.vii.1855, on the underside of a leaflet on the butternut at corner of the woodshed, save a dead one in balsam, on mica.

388. **Nematus suratus** Fitch, 1857m:386.

Nematus ventralis Say.

Original Specimens: 14,577, Salem, NY, 28.iv.1857, hatch in office.

Extant Specimens: Fitch's Type/Fitch's Coll./*Nematus suratus* Fitch/Type No.1797 (USNM).

Family CEPHIDAE

389. **Janus flaviventris** Fitch, 1862k:851.

Janus integer (Norton).

Original Specimens: 1831, Stillwater, NY, last of May, 1837.

Extant Specimens: 1831/*Janus flaviventris*/*Janus integer* Nort., Det.D.T.Ries, 1935 (USNM).

Family BRACONIDAE

390. **Sigalphus curculionis** Fitch, 1859c:221.

Nealiolis curculionis (Fitch).

Original Specimens: *2619-22, St.Catherines, Canada West, 15.vii-12.viii.1859, hatched from *Curculio* larvae in black knots, D.W.Beadle.

Extant Specimens: Fitch's Type/From Fitch's Collection/*2622/Type No.3756 (USNM).

391. **Aphidius lactucaphis** Fitch, 1855n:840.

Blacus exilis (Nees).

Original Specimens: 27.viii.1855, found dead, adhering to a leaf of lettuce, surrounded by *Aphis* sp.

Extant Specimens: Fitch's Type/Type No.1821/From Fitch's Collection/*Aphidius lactucaphis* (USNM).

392. **Microgaster robiniae** Fitch, 1859d:836.

Apanteles robiniae (Fitch).

Original Specimens: 6.iv.1859, in the white blisters of locust leaves (five of these hatched in vial, and dead, I gum to card, with two cocoons).

Extant Specimens: Fitch's Type/From Fitch's Collection/Type No.1814/*Microgaster robiniae*/*Apanteles robiniae* Fitch, female (USNM, two glue spots, fragments of three adults, and two cocoons, on a card).

393. **Toxares triticaphis** Fitch, 1861hh:840.

Pentapleura triticaphis (Fitch).

Original Specimens: 15,183, Salem, NY, 15.v.1861, in young winter wheat, of Arnott's.

Extant Specimens: 15,183/Fitch's Type/Type No.1817 (USNM).

Family APHIDIIDAE

394. **Praon avenaphis** Fitch, 1861hh:840.

Aphidius avenaphis (Fitch).

Original Specimens: 3.vii.1861, on winter wheat, with *Aphis avenae*, two specimens; 15,224, 9.vii.1861, hatched from *Aphis avenae*.

395. **Trioxys cerasaphis** Fitch, 1855n:842.

Praon cerasaphis (Fitch).

Extant Specimens: Fitch's Type/From Fitch's Collection/Type No.1818/*Praon cerasaphis*/*Trioxys cerasaphis* (USNM).

396. **Praon avenaphis obscura** Fitch, 1861hh:841.
Original Specimens: 15,226, 13.vii.1861, hatched from *Aphis avenae*; 15,240, 5.xi.1861, swept from rye with *Aphis avenae*.
Extant Specimens: 15,240/Fitch's Type/From Fitch's Collection/*Praon avenaphis*/*Aphidius avenaphis* Fitch, male/Type No.1815 (USNM); a.*obscura*/Fitch's Type/From Fitch's Collection/*Praon avenaphis*/*Aphidius avenaphis* Fitch, male/Type No.1815 (USNM).
397. **Praon polygonaphis** Fitch, 1855n:840.
Aphidius polygonaphis (Fitch).
Original Specimens: 26.viii.1855, hatched from *Aphis* on *Polygonum*.
Extant Specimens: Fitch's Type/Type No.1816, U.S. N.M./From Fitch's Collection/(*Aphidius*) *Praon* Nees., *polygonaphis*, Fitch, New York (USNM).
398. **Trioxys populaphis** Fitch, 1855n:841.
Lysiphlebus salicaphis (Fitch).
Original Specimens: 19.viii.1855, hatched from an *Aphis* on Balm of Gilead poplar; 14,113, x.1855, hatched from an *Aphis* on Balm of Gilead poplar.
Extant Specimens: 14,113/Fitch's Type/From Fitch's Collection/Type No.1819/*Trioxys populaphis* (USNM).
399. **Trioxys salicaphis** Fitch, 1855n:841.
Lysiphlebus salicaphis (Fitch).
Original Specimens: Salem, NY, 13.vii.1855, three specimens hatched from willow lice gathered in the meadow day before yesterday; 14.vii.1855, ten more specimens, from same.
Extant Specimens: Fitch's Type/Type No.1830, U.S. N.M./From Fitch's Collection/*Trioxys salicaphis* (USNM).
400. **Praon viburnaphis** Fitch, 1855n:841.
Lysiphlebus viburnaphis (Fitch).
Original Specimens: 16.viii.1855, hatched from an *Aphis* sp.
Extant Specimens: Fitch's Type/14,734/From Fitch's Collection/Type No.1356/(*Aphidius*) *Praon* Nees, *viburnaphis*, Fitch, New York (USNM).
Note: Fitch's specimen registers indicate that specimen 14,734 was probably collected in 1858, and, therefore, it probably is not part of the original type series.

Family ICHNEUMONIDAE

401. **Ichneumon leucaniae** Fitch, 1861f:276.
Pterocormus laetus (Brulle).
Original Specimens: 15,232, 20.viii.1861, hatched from pupae of army worm; 15,233, 26.viii.1861, hatched from pupae of army worm.
402. **Phygadeuon planosae** Fitch, 1856l:501.
Chromocryptus planosae (Fitch).
Original Specimens: vii.1854, hatched from *Planosa laricis*, 5 females.
Extant Specimens: Type No.1813/New York (USNM).
403. **Cenocoelius(?) ribis** Fitch, 1857m:422.
Original Specimens: 6.vi.1857, from currant stalks.

Family EULOPHIDAE

404. **Trichogramma(?) fraterna** Fitch, 1856d:235.
Horismenus fraternus (Fitch).
Original Specimens: **5837, Salem, NY, 16.ix.1855, on rose leaves under front room window.
Extant Specimens: **5837/Fitch's Type/From Fitch's Collection/Type No.1837/*Trichogramma(?)* Westwood, *fraterna*, Fitch, New York (USNM).
405. **Trichogramma(?) orgyiae** Fitch, 1856d:235.
Eulophus orgyiae (Fitch).
Original Specimens: 11,902-923, 7.viii.1846, hatched from a caterpillar of *Orgyia leucostigma*.
Extant Specimens: 11,914/Fitch's Type/From Fitch's Collection/Type No.1838/*Trichogramma(?)* Westwood, *orgyiae* Fitch, New York (USNM).

Family ENCARTIDAE

406. **Platyaster lecanii** Fitch, 1859d:805.
Coccophagus lycimnia (Walker).
Original Specimens: **3785, **4122, 5.vi.1854, from pupae of *Lecanium quercitronis*.
Extant Specimens: **3785/Fitch's Type/Type No.1828/From Fitch's Collection/*Platyaster? lecanii*, Fitch (USNM).

Family TORYMIDAE

407. **Torymus harrisii** Fitch, 1862k:839.
Cryptopristus harrisii (Fitch).
Original Specimens: *2616-17, 3750-92, 3.v.1852, hatched from diseased Virginia wheat straw from Dr.T.W. Harris.

Family PTEROMALIDAE

408. **Cleonymus clisiocampae** Fitch, 1856l:432.
Dibrachys cavus (Walker).
Original Specimens: 8.viii.1856, from pupae in caterpillar nests on chokecherry.
Extant Specimens: Fitch's Type/From Fitch's Collection/Type No.1831 (USNM).
409. **Pteromalus onerati** Fitch, 1859d:812.
Habrocytus onerati (Fitch).
Original Specimens: 10,180-182, Salem, NY, 12.v.1845, taken from a jar of squamous-imbricated willow galls which were gathered March 6th; 27.iv.1857, two specimens dead and worthless, in a vial of bullet-like oak galls put up March 28th.
Extant Specimens: 10,180/Fitch's Type/Type No.1834/*Pteromalus onerati* (USNM).
410. **Pteromalus quercipilulae** Fitch, 1859d:819.
Ormyrus quercipilulae (Fitch).
Original Specimens: 15.iv.1859, from pea-like galls on oak leaves.
Extant Specimens: Fitch's Type/From Fitch's Collection/Type No.1835/*Pteromalus quercipilulae* Fh.(USNM).
411. **Pteromalus tabacum** Fitch, 1865g:792.
Hypopteromalus tabacum (Fitch).

Original Specimens: 15,428, 6.ix.1862, fourteen specimens from cocoons on larva of *Sphinx*; 15,424, 28.viii.1864, wandering between the cocoons of *Microgaster* sp., on the back of a *Sphinx* — perhaps to oviposit in the cocoons; 15,425, 12.xii.1864, hatched from the same cocoons, in vial, in the office, 15,426, 12.xii.1864, thirteen specimens, I gum the most perfect ones to a slip of card, all females; 15,427, 15.xii.1864, from the same cocoons; 15,433, 16.xii.1864, hatched from the same cocoons as above; 28.xii.1864, two more flies come from same cocoons.

Extant Specimens: 15,424/15,425/15,427/15,433/Fitch's Type/From Fitch's Collection/*Pteromalus tabacum*/Type No. 1836 (USNM, five specimens mounted together, one without individual, numbered label).

Family EURYTOMIDAE

412. **Spalangia quercilanae dorsalis** Fitch, 1859d:816.
Eudecatoma quercilanae (Fitch).
Original Specimens: 4.v.1857, seven specimens hatched from wooly galls on white oak leaves.
Extant Specimens: 14,574/Fitch's Type/Type No.1833/From Fitch's Collection/*S. quercilanae a. dorsalis* (USNM).
413. **Eurytoma flavipes** Fitch, 1862k:845.
Harmolita hordei (Harris).
Note: This is an incorrect subsequent spelling of *fulvipes* Fitch, 1859.
414. **Pteromalus(?) fulvipes** Fitch, 1859i:115.
Harmolita hordei (Harris).
Original Specimens: **4119-21, Salem, NY, 10.vi.1854, swept from wheat stalks, Josephus Martin's hill; Cazenovia, NY, 24.vii.1857, in a vial of dry barley straw, from L.Lincklaen.
415. **Eurytoma lanulae** Fitch, 1859d:817.
Eurytoma studiosa Say.
Original Specimens: *1072-78, 10.v.1845, dead, in jar of conglomerate galls of willow gathered February 22nd; 14,573, 28.iv.1857, from a gall put up three weeks ago; 4.v.1857, one specimen from same gall.
Extant Specimens: From Fitch's Collection/6628/Type No.1824 (USNM, two specimens mounted together).
416. **Macroglenes querciglobuli** Fitch, 1859d:812.
Eurytoma querciglobuli (Fitch).
Original Specimens: **6460-61, 12.vii.1856, dead in a tumbler of galls.
Extant Specimens: *6461/Fitch's Type/From Fitch's Collection/Type No.1829/*Macroglenes querciglobuli*, Fitch (USNM).
417. **Spalangia quercilanae** Fitch, 1859d:816.
Eudecatoma quercilanae (Fitch).
Original Specimens: 14,574-576, 28.iv.1857, six specimens, hatched from wooly galls on white oak leaves, taken three weeks ago; 4.v.1857, nine specimens more from same gall.
Extant Specimens: Fitch's Type/Type No.1832/From Fitch's Collection/*Spalangia? quercilanae* Fitch (USNM).
418. **Macroglenes quercipisi** Fitch, 1859d:819.
Original Specimens: 27.iv.1857, bred from galls placed in

a vial April 2nd; 15.iv.1859, bred from whortleberry galls.

Note: A specimen in the USNM collection bears Fitch's label 15,213, and it is also labelled "Fitch's Type." According to Fitch's specimen registers this specimen was collected in 1861, and, therefore, it is not part of the original type series.

419. **Eurytoma secalis** Fitch, 1861bb:236.
Harmolita secalis (Fitch).
Original Specimens: *2627-29, PA, 3.vi.1861, eight specimens (two in Agricultural Museum) coming from rye straw, from American Agriculturist; Male, dead, in a vial of straw, ticketed "Joint worm in rye" - source forgotten, seven specimens.
Extant Specimens: *2628/Fitch's Type/Type No.1825/From Fitch's Collection (USNM).
420. **Pteromalus(?) tritici** Fitch, 1859i:115.
Harmolita tritici (Fitch).
Original Specimens: 3746-91, VA, 6.v.1852, hatched from wheat straw, received April 1st, from Dr.T.W. Harris.
Extant Specimens: Fitch's Type/Type No. 1826 U.S.N.M./ From Fitch's Collection/Md.E.L.Rogers (USNM).

Family EUCOILIDAE

421. **Allotria avenae** Fitch, 1861hh:842.
Kleidotoma avenae (Fitch).
Original Specimens: 15,185, 17.v.1861, swept from rye, with *Aphis avenae*.
Extant Specimens: 15,185/*Allotria avenae*/Fitch's Type/Type No.1811 (USNM).

Family CHARIPIDAE

422. **Allotria tritici** Fitch, 1861hh:841.
Alloxysta tritici (Fitch).
Original Specimens: 8.vii.1861, swept from winter wheat, *Aphis* infested.

Family CYNIPIDAE

423. **Figites chinquapin** Fitch, 1859d:820.
Andricus chinquapin (Fitch).
Original Specimens: 11,620, the imago, and 11,621-622, its galls, Greenwich, NY, 5.v.1846, in the woods north of Peter Dunlap's?
Note: A specimen in the USNM collection bears the label "Type No.1800, *Andricus chinquapin* Fitch." Fitch did not consider it a specimen of this species, as his handwritten label bearing a different manuscript name indicates.
424. **Philonix fulvicollis** Fitch, 1859d:783.
Philonix fulvicollis Fitch.
Original Specimens: 14,508, Salem, NY, 12.xii.1856, on snow, Jarvis Martin's woods; 14,936-939, 23.xi.1858, on snow, Jarvis Martin's woods.
Extant Specimens: 14,508/Fitch's Type/Fitch's Collection/*Philonix fulvicollis*, Fh./Type No.1802 (USNM).
425. **Biarrhiza nigra** Fitch, 1859d:782.
Xystoteras nigrum (Fitch).

Original Specimens: **372, Salem, NY, 28.xi.1851, on snow, woodlot by McDougall's Lake, placed in Agricultural Museum.

426. **Philonix nigricollis** Fitch, 1859d:783.

Philonix nigricollis Fitch.

Original Specimens: 14,935, Salem, NY, 23.xi.1858, on snow, Jarvis Martin's woods.

Extant Specimens: 14,935/Fitch's Type/Fitch's Coll./ *Philonix nigricollis*, Fh./Type No.1803 (USNM).

427. **Cynips quercusarbus** Fitch, 1859d:809.

Ceroptres quercusarbus (Fitch).

Original Specimens: Salem, NY, 28.iii.1857, irregular knobs from tips of twigs of white oak in brother Harvey's field, south of Battle Hill, placed in vial, small *Cynips* found dead, May 27th.

428. **Cynips quercusbatatus** Fitch, 1859d:810.

Neuroterus quercusbatatus (Fitch).

Original Specimens: Gall found on a young shoot of white oak, March 1, 1858; in a vial in office twelve specimens, all females, hatched March 17, and two others gnawed a perforation almost large enough to escape.

429. **Cynips quercusficus** Fitch, 1859d:812.

Ceroptres quercusficus (Fitch).

Original Specimens: Salem, NY, April, young white oak limbs in abundance, grown over with these galls.

Extant Specimens: Fitch's Type/Fitch's Coll./Type No.1808/*Cynips quercusficus* (USNM, four specimens mounted together, but only one with above labels).

430. **Callaspidia quercusglobulus** Fitch, 1859d:810.

Disholcaspis quercusglobulus (Fitch).

Original Specimens: 1530, Stillwater, NY, 4.v.1837, Wilbur's Basin, on pine leaves; 11,465-466, Salem, NY, ix.1845; two specimens found dead in a tumbler in which bullet-like galls of white oak were placed.

Extant Specimens: Fitch's Type/Fitch's Coll./Type No. 1805/*Callaspidia quercusglobulus* Fh.(USNM, two specimens mounted together).

431. **Cynips quercuslana** Fitch, 1859d:814.

Synergus quercuslana (Fitch).

Extant Specimens: Fitch's Type/Fitch's Coll./*Cynips quercuslana*, Fh./Type No.1810 (USNM).

432. **Cynips quercuspisum** Fitch, 1859d:818.

Ceroptres quercuspisum (Fitch).

Original Specimens: i.1855, galls adhering to under surface of oak leaves; Salem, NY, 22.ix.1856, Battle Hill, another gall found and enclosed in a vial, hatched 1.iii.1857; 20.v.1857, five of these galls (one of them double) put in a vial April 3, the double gall hatches two specimens.

433. **Cynips quercustuber** Fitch, 1859d:806.

Ceroptres quercustuber (Fitch).

Original Specimens: Salem, NY, 19.iv.1859, find several of these galls on Titus's Hill.

Extant Specimens: Fitch's Type/Fitch's Coll./Type No.1809/*Cynips quercustuber* (USNM, three specimens mounted together).

434. **Figites rubuscaulis** Fitch, 1862c:335.

Original Specimens: Lockport, NY, 20.iii.1857, sixteen specimens from E.S.Holmes; 4.iv.1857, twelve specimens from a gall put in a jar a month ago; Poughkeepsie, NY, 5.iv.1862, twenty specimens from two galls, in a warm room since December 4, from Edward Merritt; 24.iv.1862, ten more from same galls.

Family DIAPRIIDAE

435. **Diapria agromyzae** Fitch, 1856l:535.

Trichopria agromyzae (Fitch).

Original Specimens: 14,235-237, Salem, NY, from wheat worms on threshing floor.

Extant Specimens: 14,235/Fitch Type/From Fitch's Collection/Type No.1841/*Diapria agromyzae* (USNM, two specimens mounted together).

Family SCELIONIDAE

436. **Telenomus orgyiae** Fitch, 1863e:679.

Telenomus dalmani Ratzeburg.

Original Specimens: 20.vi.1863, inserting its eggs into those of *Orgyia*.

Extant Specimens: Fitch's Type/From Fitch's Collection/*Telenomus orgyiae*/Type No.1839 (USNM).

Family PLATYGASTERIDAE

437. **Platygaster error** Fitch, 1861hh:818.

Euxestonotus error (Fitch).

Original Specimens: 21.vi.1861, with midge, on winter wheat.

438. **Platygaster herrickii** Fitch, 1863j:312.

Platygaster hiemalis Forbes.

Family FORMICIDAE

439. **Formica caryae** Fitch, 1855n:855.

Camponotus caryae (Fitch).

Original Specimens: *8135-39, Salem, NY, 4.ii.1851, under shaggy bark of hickory trees, in orchard; **5039-65, Salem, NY, 29.i.1855, in burrows in bitter walnut firewood; **5249-77, Salem, NY, 2.iv.1855, in burrows in bitter walnut firewood.

Extant Specimens: *8135, **5058, **5064, **5251, **5253, **5262-64, **5267, **5271-73, **5275, **5277/Fitch's Type/Type No.1842/Fitch's Collection (USNM, fourteen separate specimens); **5266/Fitch's Type/Type No.1842/ Fitch's Collection/*Formica caryae*, Fh., female (USNM); *8137, **5041-43, **5045, **5054-55 (MNHN, seven separate specimens).

440. **Myrmica cerasi** Fitch, 1855n:834.

Crematogaster cerasi (Fitch).

Extant Specimens: N.Y./Collection T. Pergande/No. 53583, Cotype (USNM).

441. **Formica novaeboracensis** Fitch, 1855n:766.

Camponotus novaeboracensis (Fitch).

Original Specimens: 9.iv.1855, in a burrow in decaying buttonwood; 12.viii.1855, guarding plant lice on apple

trees; 31.viii.1855, guarding plant lice on plum trees; 31.viii.1855, guarding plant lice on Balm of Gilead.

Extant Specimens: Fitch's Type/Type No. 1843,

U.S.N.M./*Formica novaeboracensis* (USNM); Fitch's Type/Type No.1843, U.S.N.M./Fitch's Collection (USNM, two separate specimens).

Class ARACHNIDA

Order ARANEIDA

Family THERIDIIDAE

442. ***Theridion brassicae*** Fitch, 1871:563.

Theridion frondeum Hentz.

Original Specimens: 13.ix.1870, one or two seen on underside of three or four of the outer leaves of a young cabbage; 15.ix.1870, a larger one found on underside of a cabbage leaf, and smaller ones under three or four cabbage leaves.

Family EPEIRIDAE

443. ***Epeira decipiens*** Fitch, 1856l:451.

Araneus curcurbitinus Clerck.

Original Specimens: 14,162, Salem, NY, 20.iii.1856, in a tuft of dead leaves.

Family DICTYNIDAE

444. ***Theridion hypophyllum*** Fitch, 1871:564.

Dictyna foliacea (Hentz).

Original Specimens: 13,897, Salem, NY, 25.x.1853, on snow, Jarvis Martin's woods; 13,902, Salem, NY, 26.x.1853, in the office; 13,988, Salem, NY, 12.xi.1853, on wood pile, in the back yard; Salem, NY, 9.ix.1870, under cabbage leaves in the garden; Salem, NY, 1.x.1870, on underside of maple leaf in front yard; Salem, NY, 22.iv.1871, in garden.

Unplaced Araneida

445. ***Ixodes(?) odontalgiae*** Fitch, 1872a:371.

Extant Specimens: *Ixodes? odontalgiae*/Fitch's Collection/TYPE/Type No.1346 (U.S.N.M., National Parasite Collection No.3477).

Note: The specimen is an immature spider of unknown taxonomic affinity.

Order ACARINA

Family IXODIDAE

446. ***Ixodes cruciarius*** Fitch, 1872a:366.

Ixodes cookei Packard.

Original Specimens: 8.ix.1857, on Anna's arm; 15,669, 1.xi.1868, on a mink; 15,670, 1868, on Miss Turner's leg, in bed, by night.

Extant Specimens: 744/TYPE/Fitch's Collection/Fitch's Type/Type No.1347 U.S.N.M.(USNM, National Parasite, Collection No. 3476, National Tick Collection No. RML 118015).

447. ***Ixodes quinquestriatus*** Fitch, 1872a:366.

Dermacentor variabilis (Say).

Original Specimens: 744, Cartersville, VA, 1847, from Thaddeus A.Culbertson; 1256, Tullehassie, AR, 1850, from Wm.S.Robertson; 2995, Tullehassie, AR, from Wm.S. Robertson; 5688, 5760, Tullehassie, AR, vii.1852, from Wm. S.Robertson.

Extant Specimens: 2995/1256/5688/*Ixodes 5-striatus*, Ark., W.S.Rob./Fitch's Collection (USNM, 3 specimens in same vial, National Parasite Collection No. 3472, National Tick Collection No. RML 118013); 744/TYPE/Fitch's Collection/Fitch's Type/Type No.1348 U.S.N.M./*Ixodes 5-striatus*, Va., T.A.Culb.(USNM, National Parasite Collection No.3473, National Tick Collection No. RML 118014).

448. ***Ixodes robertsonii*** Fitch, 1872a:366.

Dermacentor variabilis (Say).

Original Specimens: 2859, Tullehassie, AR, 1851, from Wm.S.Robertson; 6364, IL, 13.viii.1852, from Wm.S. Robertson, bank of Illinois creek, Park hill.

Extant Specimens: 6364/*1639/TYPE/Type No.1351, USNM/*Ixodes robertsonii*, Fitch/Fitch's Collection (USNM, 2 specimens in same vial, National Parasite Collection No.3475, National Tick Collection No. RML 118012).

Family UROPODIDAE

449. ***Uropoda formicae*** Fitch, 1855n:857.

Family ACARIDAE

450. ***Tyroglyphus ribis*** Fitch, 1857m:424.

Family ORIBATULIDAE

451. ***Oribata quadripilis*** Fitch, 1857m:442.

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